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THE

Montreal Medical Journal

A MONTALY RECORD OF THE

PROGRESS OF MEDICAL AND SURGICAL SCIENCE.

EDITED BY

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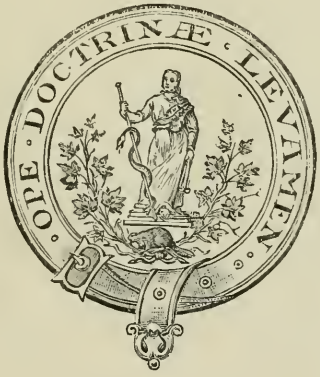

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Original Communications.

REMARKS ON TWO OR THREE POINTS IN THE TECHNIC OF THE OPERATIVE TREATMENT OF ACUTE APPENDICITIS.

BY

GEORGE E. ARMSTRONG, M.D.

Associate Professor of Clinical Surgery, McGill University; Surgeon to the Montreal General Hospital; Attending Surgeon to the Western Hospital, Montreal; Consulting Surgeon to the Protestant Hospital for the Insane, Verdun.

The frequency and importance of operation for acute appendicitis, renders a discussion of the technic of great interest to surgeons. Operations for the relief of this, most fatal disease, are performed more frequently than for any other acute surgical affection. The mortality rate is being lessened year by year. The greater number of recoveries now than formerly is due chiefly to four factors:

I. An earlier and more correct diagnosis.

II. Earlier resort to surgical treatment in suitable acute cases.

III. Improved methods of operating.

IV. To operation in the interval.

My purpose this evening is to excite a discussion on one or two points in the operation for acute cases.

One question that frequently arises at the operating table is, what is the best course to pursue in the case of a localised abscess.

This question really includes two questions; the treatment of the appendix vermiformis, and the treatment of the abscess walls. If the appendix is easily found and is free, undoubtedly it should be tied off. The cause of the condition is before the operator, is accessible, and on general principles it should be removed. This unfortunately is not always the case. Only too often, after the abscess contents are removed the appendix is not visible and cannot be felt, and it is at this point that difference of opinion, as to the proper course to pursue

arises. One naturally turns to the writings of well known surgical authors for light, and while many state that the appendix should always be looked for, found and removed, and the operation completed, other writers of equal or greater experience, would be satisfied to drain the abscess cavity, and to do nothing more. Treves in his recently published System of Surgery says: "The abscess should be opened and drained. It should not be scraped and it is of no avail to make search for the appendix."

Maurice H. Richardson, who wrote the article on Surgery of the Abdomen in Park's Surgery by American Authors, says: "In cases of abscess incised through strong adhesions, the operator should be satisfied with simple drainage when the appendix is not easily accessible." Compared with Mr. Treves this statement of Richardson is considerably modified and guarded.

McBurney advises against the breaking down of adhesions indiscriminately, in search for the appendix for fear of infecting the general peritoneal cavity.

In view of the difference of opinion among operators, one is driven to closer study and more careful observation of his own cases. There seem to be two objections to searching for a hidden appendix in the wall of a foul abscess cavity. One is that it is unnecessary and the other that the peritoneal cavity will be exposed to infection thereby. As to the first, it may be said that the patient generally recovers when the appendix is left behind, often promptly: sometimes only after a tedious convalescence, and occasionally, the recovery is followed by a relapse. The possible infection of the peritoneal cavity is a matter of graver importance. The search for the appendix generally means the breaking down of the limiting adhesions, and the exposure of the peritoneal cavity to infection. In hospital practice, a surgeon should be able to do this without infecting the peritoneum. This has been my practice in recent acute cases, and so far I have never known infection of the peritoneal cavity to follow. It is difficult to attain this perfection of technic in private houses, and probably an operator who only does this operation once or twice a year would do more wisely to stay his hand and simply drain, but I feel quite sure that in hospitals, cases are saved by this procedure that would otherwise be lost. The appendix can not be considered alone. The operator must have regard to the tissues that form the abscess wall. The abscess wall is often formed partly by a portion of the omemtum, rich in veins and lymphatics along which infection may spread. Again the wall may be partly formed by mesentery, and when the foul abscess contents are

removed one not infrequently finds the veins of the mesentery lying alongside, and in a position to be easily infected.

The first case of appendicitis that I operated upon presented this condition. In Feby. 1884, I operated upon a young man, 19 years of age, for acute appendicitis on the 24th day of his illness. A large pericæcal abscess was opened and drained. He died on the 6th day after operation, and at the autopsy, performed by Dr. Osler, the mesentery was found forming the inner wall of the abscess cavity and the veins of the mesentery right away up to the liver were found full of pus, and the mesenteric glands involved.

In two cases of operations since that time, Dr. Wyatt Johnston has found a similar condition, pylephlebitis of the branches of the portal vein and liver abscess. One of these cases had been under treatment for a period of about six weeks for malaria before being brought to the hospital, the recurring chills and sweats being mistaken for that condition.

The question, then, what to do in abscess cases resolves itself into, what is the structure, condition and age of the abscess wall. The change in the form of the question does not however, lead to a more ready answer, although I think, it puts the question in a clearer light. These abscess cases call forth the operator's best judgment, and each case must be decided on its merits. I may say that at present I think that as a rule, in recent cases with easily separated adhesions, it is wise to remove the appendix and as much of the abscess wall as in the operator's judgment, can be removed safely, thereby removing the cause and insuring rapid convalescence, freedom from recurrence, and preventing disastrous seqelæ. In cases of long standing, that have lasted over a week, a more conservative course is, perhaps, wiser The abscess walls are probably at that stage made up chiefly of a thick layer of fibrous tissue, which is not absorptive, or the patient is not in condition to bear a prolonged operation. Such abscesses are often prominent in front or latterly, are not in contact with the mesentery, and are not likely to give further trouble after being incised and drained. The fact that the patient is alive, a week or ten days after the onset of the disease, is evidence of the nature and composition of the abscess wall.

The objections to leaving the appendix, and being satisfied with incision and drainage are several. I have already mentioned the danger of septic pylephlebitis and thrombo-phlebitis. This condition is generally disastrous in its results and the early removal of the septic focus is the rational preventive measure that suggests itself.

Recurrence, due to septic centres being left behind is another not

very infrequent result of leaving the appendix. The second operation if required, is, as a rule, a safe one, but it is an operation, a thing which a patient once operated upon dreads, to say nothing of the chances of a fatal result.

Another very serious objection to simple incision and drainage in abscess cases, is the danger of leaving a second abscess unopened. It has probably happened in the experience of all operators, that at the autopsy a second abscess, unsuspected and unopened has been found from which the septic absorption which caused death took place.

In one of my recent cases, I was asked to examine a patient who was said to be suffering from a prostatic abscess. The patient gave no history of urethral or bladder disease. Upon examining per rectum the prostate felt normal as to size, consistency and tenderness, but above the prostate in the recto-vesical pouch a distinct fluctuation was felt. This together with a history of abdominal pain, of sudden onset, accompanied by nausea and elevation of temperature, led to the diagnosis of appendicitis. The abscess was readily reached through an abdominal incision, and the pus removed. Nothing was to be seen or felt of the appendix. Search being made for it, a second abscess was discovered situated behind and external to the cæcum and ascending colon, and the appendix was found lying in this second abscess and removed. It is highly probable that had search not been made for the appendix, the second abscess would not have been found and the patient would very likely not have recovered. Such experiences are not uncommon, and they lead one to hesitate, in recent cases, when advised to simply incise and drain.

The other point that I will mention is drainage in cases of septic peritonitis, local and general.

After the fluid has been removed from the peritoneal cavity as thoroughly as possible, how are we to prevent a re-accumulation. If one may judge from what one reads in books and medical journals, gauze, generally iodoform gauze, is very largely used by surgeons for this purpose. Others prefer drainage by tubes, glass or rubber. In my hands gauze drainage in septic peritonitis has never been satisfactory. I have dropped it again and again firmly resolving never to use it in another case. A few weeks or months later an article strongly advocating drainage by gauze written by some one in whom I had confidence would appear, and I would use it once more. But in each instance the same results would be obtained. The gauze would remove some of the most liquid portion, the serum, and leave the thicker part, the pus, behind, in the bottom of the cavity. I have used for drainage gauze prepared in many different ways, different

kinds of iodoform gauze, and plain washed gauze, and I have never yet seen gauze that would drain pus out of the bottom of the pelvis or from one of the flanks. Not only will it not remove the pus, but it will actually dam it back and more or less obstruct its outflow. Of course it is not possible, probably, to get perfect drainage up hill, but much better results may be obtained by using tubes than by using gauze. By using tubes one can obtain, so far as the abdomen is concerned, dependent drainage. A glance at the morphology of the posterior wall of the abdominal cavity or what forms the floor, when the patient is in the recumbent position as after an operation for septic peritonitis, shows that there are three dependent regions, the two flanks and the pelvis. In emptying the abdomen of fluid the last will be taken from one or the other of these regions. All the fluid in the abdomen gravitates in this direction, and if the fluid is removed from the two flanks and the pelvis as fast as it accumulates there will be attained practically, dependent drainage of the abdomen. Now this cannot be brought about by gauze but it can be by tubes. I prefer large rubber tubes. I sometimes use them as large as $\frac{5}{8}$ inches in diameter. They should not be perforated. Perforation only gives a chance for a piece of omentum or intestinal wall to enter and give trouble, and they are useless. The fluids will gravitate to one of these regions without help. This large tube can be sucked out with a syringe or wiped out with bits of gauze, without causing the patient any inconvenience whatever. This is one of the great advantages of the large tube. The dressings are absolutely painless. I leave a small strip of gauze through the tube, right to the bottom which drains away the serous part and renders the necessity for dressing and cleaning the tube less frequent. One, two or three tubes should be used, according to the number of dependent regions, that, in the opinion of the operator should be drained. On the contrary, if these spaces are not kept empty they become filled first and then the fluid backs up among the intestines. This plan lessens the necessity of trying to drain away the fluid from among the coils of small intestines. I never could succeed in placing gauze strips between the coils in a manner at all satisfactory to myself. The strips soon become more like ropes and if peristatsis is at all active and it should be, the strips soon become displaced.

During my last term of attendance there were admitted to my wards in the Montreal General Hospital twenty-six cases of appendicitis; of these seven were discharged well, without operation. Nineteen were operated upon and they all recovered but one. There were four cases of general peritonitis, with commencing paresis of the

intestinal walls. They all were treated by drainage in the way that I have indicated and they all recovered. Five were abscess cases, and the only death in the seven occurred in one of these cases. The patient was a young girl, in whom the disease began five days before admission to the hospital. An abscess was opened, cleaned with swabs and the appendix removed. During the succeeding eleven days she did well. The temperature became normal, the pulse improved and she was regarded as convalescing, and out of danger. On the twelfth day after operation she was suddenly seized with a chill, the temperature rose to 104° F. and subsequently became decidedly septic. Four days later, or on the sixteenth day after the first operation a second was performed by my colleague, Dr. Kirkpatrick. It was unsatisfactory. No peritonitis was found, and her condition was not improved. She died four days afterwards, or twenty days after the first operation. Unfortunately we were unable to obtain an autopsy and the cause of the septic condition and death is a matter of conjecture. The symptoms however closely resembled the cases of pylephlebitis and liver abscess that I have referred to and I think that probably that is the condition that would have been found in this case had an autopsy been permitted. Nevertheless, one death in five abscesses and four general peritonitis cases is a good result, and I believe was attained by the application of the principles and methods of technic which I am advocating.

EXPERIMENTAL RESEARCH ON THE ACTION OF ANTIPYRINE.[1]

BY

ANDREW HALLIDAY, M.B., C.M. Shubenacadie N.S.

The antipyretics may be classified according to either their chemical construction or their clinical action. *Les Nouveaux Remedes* (1895) divides them into the following six classes (1) Phenols ; (2) Aromatic acids ; 3) Anilides ; (4) Phenylhydrazin ; (5) Quinolin ; (6) Pyrrol, Laborde divides them into (1) Fundamental analgesics and (2) True Antithermics which are also antiperiodics.

The following extract from the British Medical Journal (March. 1894) expresses so very fully the usually accepted views of the physiological action of antipyrine that I quote it at length. "All the aromatic compounds have a definite action upon protoplasm and to this as Schmiedeberg points out the influences upon the temperature and metabolism in febrile states are probably related. Antipyrine acts on the cerebro-spinal nervous system, in moderate doses effecting a fall of temperature and slightly raising the blood pressure. This action on the heat mechanism has received widely different interpretations and experiments have only yielded contradictory results. Wood and others hold it is due to decreased heat production, while Gottlieb from calorimetric observations affirms that antipyrine quickens the heat dissipating mechanism. However that may be, large doses depress the nervous system and lower the blood pressure, and symptoms varying from an unpleasant diaphoresis to severe collapse have been met with after administration. . . Marked palpitation and disturbances of the heart's rhythm are not uncommon and while these symptoms are referred with some probability to changes in the vasomotor system we cannot altogether exclude a toxic effect upon the cardiac muscle. This should be borne in mind in acute pneumonia where cases of death after antipyrine have been recorded. Again the cardiac and respiratory systems may be influenced directly through the medullary centres ; or on the other hand secondarily from changes in the hæmoglobin of the red blood corpuscles resulting in methæmoglobin-æmia. This is seen in various degrees of cyanosis which is so common. . . In small doses antipyrine acts as a stimulant to the nervous system, and like quinine and salicylic acid may induce a

[1] (Abstract of paper read before the Nova Scotia Branch, British Medical Association.)

slight rise in the body temperature. This action is sometimes present after moderately large doses and instead of the anticipated fall there is a rise in the temperature curve with an exaggeration of symptoms already existing. This has been explained by vasomotor changes leading to dilatation of capillaries in the thermogenic centres. Gottlieb's experiments show that while loss of heat is much increased after antipyrine, heat production is likewise stimulated and it is possible therefore to account for these anomalous results by assuming the failure of the former action."

Whitla states that antipyrine produces convulsions in the lower animals, that it paralyses the frog's heart, that it alters the colour of the blood, and that it diminishes heat production by its action "upon the heat centres situated in the corpus striatum."

In this paper the subject will be treated in three divisions:

(1) Experiments on frogs.
(2) Experiments on rabbits.
(3) General observations on the action of the drug.

EXPERIMENTS ON FROGS.

(1) Antipyrine in a toxic dose injected into the dorsal lymph sac causes paralysis. This begins in the posterior extremities and gradually extends forwards. At first the hind legs are dragged when a leap is accomplished but ultimately the frog is perfectly unable to leap at all, and when placed on its back is unable to regain its normal position. Tapping the spine or making a sharp sound will cause a spasmodic kick when voluntary motion is lost.

Spectroscopic examination of the blood gave the distinct bands of oxyhæmoglobin and never those of methæmoglobin.

(2) Sometime after injecting a toxic dose, (*a*) muscle nerve preparation was made and the muscle curves were taken in the usual way. Both "make" and "break" contractions were obtained, a large "break" and small "make." In half an hour the small contraction had disappeared, and the large though considerably diminished was of a fair size an hour later.

(3) Antipyrine was injected into a frog and preparations were made of both legs. The left was brushed with a normal saline solution and the right with a 4% antipyrine solution. The left gave contractions, but the right gave neither a "make" or "break" curve.

(4) Preparations were made of both legs of a frog to which no antipyrine had been administered. The sciatic nerve of one was allowed to lie for 5 minutes in an antipyrine solution and the other in normal saline. The one treated with antipyrine gave a "make" contraction

only while the other gave both "make" and "break," strength of current, direction, &c., being the same in both instances.

(5) A frog was anæsthetised and one leg amputated and a preparation made of it. The frog was then poisoned with antipyrine and a preparation made of the other leg. Both legs gave a contraction of about equal magnitude but with the poisoned one the period of latent stimulation and also the period of contraction was much prolonged.

(6) The cerebral lobes of a frog were removed and the reflexes of the cord tested by Türck's method before and after poisoning. The average time before was about ten seconds, and half an hour after administration it was about 2 minutes.

EXPERIMENTS ON RABBITS.

General symptoms of poisoning.—In a short time after administration of the drug the gait of the rabbit becomes ataxic, and when sitting still has a swaying movement as if due to want of equilibrum; the eyelids partly closed and the pupils contracted. The hind legs get spread out (just like the frog's) and in a short time the animal falls over on its side and goes into active clonic convulsions. These always commenced in the hind legs. The whole four limbs now make regular purposive movements like those of swimming. They move very rapidly. The body now is convulsed and thrown backwards (opisthotonos). The legs gradually become less rapid in their action and remain to some extent in a state of tonic contraction, but the muscles of mastication and the protruders of the tongue exhibit the clonic spasms just as the limbs previously had done. Cyanosis was distinctly evidenced by the colour of the lips and tongue. Slight stimulation such as blowing the breath gently on the surface of the body greatly intensifies the reflex movements and convulse the animal.

The experiments on rabbits are divided into two classes (1) Those in which the thermal centres were intact and (2) Those in which they were destroyed. These may again be sub-divided into calorimetric and incubator experiments.

A.—EXPERIMENTS WITH THERMAL CENTRES INTACT.

I. Calormetric.—These experiments showed that normal rabbits on an average raised the temperature of 14 litres of water 1° F. where as when antipyrine had been injected less heat was given off, the water being raised only 0·5 F. even although the temperature of the rabbit fell still less.

This series of experiments went to show that the actual amount of heat generated by the rabbit was less when antipyrine had been administered and it is only fair to assume that, since all the other

conditions were the same, antipyrine was the agent to which this was due.

II. Incubator Experiments.—The temperature of rabbits was taken and they were put into an incubator and their temperature thus raised artificially by it. These were repeated but with the difference that antipyrine was administered to show if it prevented or checked the rise.

In some cases it seemed to prevent it rising so rapidly or so high but in others it seemed absolutely without any effect.

III. Incubator and Calorimeter Combined.—In this series the temperature was artificially raised and the animal was then put into the calorimeter and the heat given off estimated. The experiment was varied by the administration of antipyrine before putting the rabbit into the calormeter.

The general conclusions arrived at were that thermogenesis was actually checked.

B.—EXPERIMENTS IN WHICH THERMAL CENTRES WERE DESTROYED.

In such a class of experiment as this it is very difficult indeed to exclude error and fallacy. We have to remember that the shock of the operation itself has a decided effect on the temperature apart from actual destruction of the thermal centres, so it is by no means a simple case of *post hoc ergo propter hoc.* A test experiment was first tried and the conditions were as far as possible maintained the same in all the cases. The skull was trephined and the area of the thermal centres, between and encroaching on the optic thalami and corpora striata, destroyed with a needle. The rabbits were then put into the calorimeter with and without the administration of antipyrine; also into the incubator under like conditions.

It actually did seem as if even then antipyrine diminished the quantity of heat produced, thus the following results were obtained and corroborated on several occasions although not always.

A rabbit's temperature was 100° F. It was put into the calorimeter for an hour and the temperature of 14 litres of water was raised 2° F. while the rabbit's fell from 100° to 84° F.

Antipyrine was then administered and after another hour the water was raised 1° F. and the rabbit's fell 4°.

From this it would appear that 15·5 calorics were given off in the first hour and 7·7 calorics in the second.

The question arises however, as to whether it was due to heat dissapation or diminished production and how many calorics in these cases represent the specific heat of the rabbit.

(All of these experiments were frequently repeated as given in detail in the original paper).

GENERAL OBSERVATIONS ON THE ACTION OF THE DRUG.

I. Effect on the Protoplasmic Elements.—The mesentery of a frog was drawn out and the movements of the corpuscles observed under the microscope.

I was unable to determine that antipyrine had much effect on the leucocytes. I am persuaded however, that it has an effect on the red nucleated corpuscles of the frog and that it will prevent and arrest diapedesis when applied locally in a fairly strong solution.

II. Effect on the Blood.—Henocque,[1] at the French Congress of Internal Medicine, held at Bordeaux, Aug. 1895, communicated on the action of antipyrine. He claims for it a local hæmostatic action and then states that the action of antipyretics when given in toxic doses is to change the oxyhæmoglobin into methæmoglobin, and when the elimination of the latter is hindered cyanosis is the result. He says that these phenomena may be studied hæmato-spectroscopically.

Bartholow (7 Edn. p. 881) says: "Antipyrine diffuses into the blood promptly and when the quantity is sufficient, brings about important changes in its constitution; the corpuscles are altered in form, the hæmatin separates and the whole mass of the blood assumes in consequence a chocolate tint."

I have made many observations of the blood after poisoning, both microscopically and spectroscopically. I have made cover glass preparations of the blood before and after poisoning and cannot detect any change in the form of the corpuscles.

I have examined the blood of the frogs spectroscopically and never got anything but the distinct bands of oxyhæmoglobin, even with blood taken from the liver, cavities of the heart and elsewhere. Blood was also taken from the cyanosed lips and other parts of a rabbit both *ante* and *post-mortem*. The rabbit had gr. 50, of the drug, and died from its toxic effects, yet the spectrum of methæmoglobin was certainly not present.

Last November I was unfortunate enough to have myself a temperature of 102° F. I took antipyrine and examined my blood spectroscopically every ten minutes till the temperature was reduced to 99° but still I got no spectrum of methæmoglobin.

Thus then I am forced to the conclusion that while acetanilid and the other congeners of antipyrine may change the blood in this respect, antipyrine itself does not in clinical doses and I question very much if it does in toxic ones.

[1] British Med. Journal.

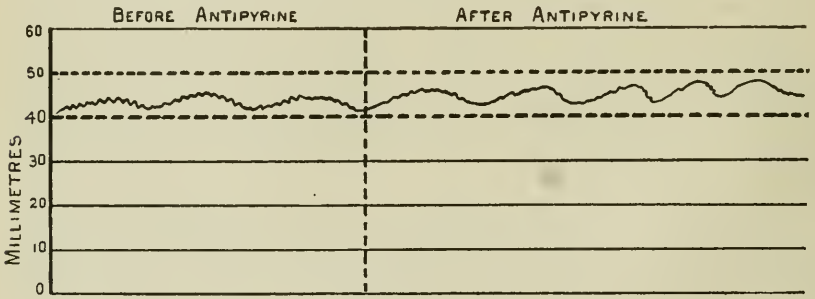
Dr. Wilkinson, from the Pathological Laboratory of University College, Liverpool, gives a report in the *British Medical Journal*, Sept. 26th, 1896, on "The action of drugs on the leucocytes of the blood." He states that the drugs he used, of which antipyrine was one, caused first a diminution and then an increase in the number of leucocytes, the poly-nuclear relatively more than the mono-nuclear.

I took the drug myself and examined frequently the blood stained (eosin and hæmatoxylin) and unstained.

I cannot say I noticed the diminution Dr. Wilkinson speaks of, but I can corroborate the fact of the increase, and that particularly as regards the poly-nuclear forms.

III. Effect on the Blood Pressure.—I took the drug myself and then sphygmographic tracings of my pulse at frequent intervals and did not find the blood pressure in any way diminished with a dose of XV grains.

I also took the pressure directly from the carotid of a rabbit to which the drug was administered with the following result:



A perfusion experiment through the heart of a frog was also performed with an antipyrine solution and it certainly did not depress, but rather stimulated it to more active contraction.

IV. Effect on the Urea.—Antipyrine was taken on three consecutive days, gr. 40, 60 and 60.

	Sp. Gr.	Quantity.	Solids.	Urea.	% Urea.
1st Day	1016	1.155 cc.	45.058 gms.	21.945 gms.	1.9
2nd "	1013	1.320	39.982	18.320	1.4
3rd "	1020	1.030	60.580	20.288	2.0
Average		1.168 cc.	47.873	20.184	1.76
Average after 3 days on same diet without drug		1.342	49. 05	29.230	1.52

We thus see that antipyrine decreases the total urea by 9 grammes.

V. Effect on the Nervous System.—Langlois and Guiband gave graduated doses to animals in which the spinal cord had been divided below the medulla and distinguished several stages of poisoning. They conclude that "antipyrine has an eclectic action on the higher centres and this explains why its sedative action is more marked in head affections than in spinal."

I have endeavoured to repeat their experiments and have entirely failed to observe their somewhat arbitrary division or stages of the nervous phenomena. Neither does my description of the phenomena accompanying the death of a rabbit from a toxic dose quite agree with their classification. From my observations of the action of the frogs and rabbits and also clinically, I am led to the opinion that the *primary action* of antipyrine is, in moderate doses, essentially sedative to the cerebro-spinal system, although this does not seem to obtain with large doses. That it has a sedative action or at least a depressing one on the motor nerves is seen from its effect on the muscle curve.

The effect on the sensory nerves is more difficult to determine. I tried several experiments with this object in view but the results were much too unsatisfactory to draw any conclusions from. But the very fact that the drug is analgesic is in itself a proof, and if we take into account the existence and structure of the neuro-dendron and the sedative action on individual motor-fibres we can thus have a fairly accurate idea of how the effect of the drug is produced.

It probably has a sedative action on the spinal cord when given in properly graduated doses. This is borne out by the fact that it is of such great benefit in the neuralgic pains of locomotor ataxia.

Again, while one large dose may exalt the condition of the spinal reflexes as seen from the experiments, it may be given in increasing doses without these appearing. Dr. McCall Anderson gave 25, 30 and even 40 grams thrice daily to patients of the ages of 9, 12 and 13 years respectively, and thus claims to have found almost a specific for chorea.

VI. Antipyretic or Antithermal and other Effects.—These have already been taken up under the various series of experiments so I will not add anything further here.

One point of very great interest physiologically is this: with the centres destroyed it was very difficult indeed to raise the temperature in the incubator, while when these were intact the temperature would rise rapidly and this indeed with a lower temperature of the incubator; thus the temperature of one rabbit rose to 105° with the incubator a little over 100° but in a case in which the centres had been

destroyed, and with the incubator at 112°, the rabbit's temperature was only raised 1°.

This then shows that such are not merely "cooking experiments" as Peters, of France, characterised such when performed by Bernard, because the incubator must after a time have raised the temperature of a dead rabbit to one uniform with its own.

Again, we see how rapidly the temperature falls. If it is not due to increased dissipation of heat it must mean diminished metabolism and this again diminished thermogenesis, which would point to the theory that the nerves, anabolic and katabolic, are intimately connected with the heat regulating centres.

Another interesting fact is that the centres are so much more easily exalted than depressed from the normal. It would seem that they keep up a constant watchful action over the vital processes in the body, and when irritated they cause an intensified activity of the same. Their action seems to be somewhat analogous to that of the motor centres, maintaining as they do a certain degree of muscular tonicity and yet causing an intensified action when irritated.

Again, shock itself is probably among other things depression of the thermal centres.

In considering all such experiments, however, as the foregoing it must be remembered as Dr. Wesley Mills so well points out and insists on, that the results must not be taken alone for they do not always represent the whole facts, since physiological isolation is more or less impossible.

Again, while there may be thermal centres presiding over the production and regulation of heat in the animal body, nevertheless thermogenesis is ever and always must be, co-extensive with life itself.

A CASE TREATED WITH ANTI-STREPTOCOCCUS SERUM INJECTIONS, WITH RECOVERY.

BY

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Sarah McM.. aged 36, single, weight, 116 lbs., was admitted to the Brockville General Hospital, February 1st, 1897. The patient had been under my care for a short time, and as the result of repeated examinations and a more or less well defined train of symptoms, I advised an operation, which would allow me to examine the gall-bladder and at the same time fix in position a wandering right kidney.

Her general condition was fairly good though she had not enjoyed robust health for two years, and was slowly but steadily losing strength.

Her family history was decidedly tubercular, several brothers and sisters being afflicted.

The heart and lungs were normal, and the urinary analysis negative.

A few days after her admission I operated, assisted by Drs. Cornell and Judson. My incision was made in the right linea semi-lunaris, from the costal margin, three inches in length.

The right kidney was found to have risen from its bed, and could be easily moved to the left of the median line and downward to within an inch of the anterior superior spine of the ilium ; it was easily replaced, and with more difficulty fixed by means of chromicised catgut, my suture being passed deeply into the right quadratus lumborum and through the cortex of the kidney.

An exploration of the gall-bladder revealed a calculus about the size of a marble embedded and acting as a ball valve in the neck of the bladder and preventing the entrance of bile and the exit of mucus, which was evidently secreted as a result of a catarrhal process in the mucous membrane.

The calculus was removed through an incision at the fundus and the patency of the cystic duct restored.

The margins of the opening in the fundus were stitched to the upper angle of the abdominal wound.

The right ovary which had undergone cystic degeneration, with an abnormally large (size of a walnut) " hydatid of Morgagni," attached by a fibro serous band, four inches in length, was removed.

The appendix vermiformis, which had evidently been the cause of several attacks of " colic" (?) was next examined. It was found

congested and stenosed at its base; it was accordingly amputated, the peritoneal cuff being closed with horse hair sutures.

The abdominal wound was now closed in layers, except at the upper angle, through which the gall-bladder was drained with gauze.

The patient rallied nicely from what proved to be a tedious operation, and no constitutional or local evidence of infection was visible until the fourth day, when an abscess at a stitch at the lower part of the wound was detected.

The source of infection could not be discovered, no fault in the technique being revealed: and in spite of careful dressings, the protonuclein course, saline irrigation, formalin flushing, and the thorough opening of all septic foci, the suppurative process continued, remaining however, extra peritoneal and dissecting between the abdominal muscles.

The temperature ranged between 100° and 103°, and the pulse from 100 to 140; every symptom of septic intoxication presented itself and the patient gradually sank into a pitiable condition.

The loss of flesh was very pronounced, and five weeks after operation, my resoures about exhausted, I decided to test the efficacy of serum therapy. I communicated with Parke, Davis & Co., of Detroit, and promptly received a fresh preparation of their anti-streptococcic serum.

I injected 10 cc. under the left mamma. No physiological effects were apparent until four hours after the injection, when her pulse dropped from 126 to 116, remaining regular and with no variation in volume, and the temperature from 100.2 to 99.6°; the patient complained of nausea for some hours and vomited.

Fourteen hours after the injection the patient voluntarily expressed herself as feeling much better than she had felt for days, and the quantity of pus had decreased materially. Eighteen hours after the first injection I gave a second 10 cc., and on this occasion a slight reaction occurred three hours afterwards, the temperature rising 1.2 points, and the pulse from 116 to 124; both subsided gradually and twenty hours after the second injection, the temperature touched normal for the first time in 38 days and remained at that point for 30 hours, rising half a degree towards the evening of the 40th day. The wound had almost ceased secreting pus, and the granulations were rapidly filling in what had been a gaping cavity in the abdominal wall.

From this period the patient's convalescence proceeded in leaps and bounds, and the cadaverous, hollow-eyed perspiring wreck became imbued with new life and vigour; she gained flesh rapidly with the

assistance of Extract of Malt and Hypophosphites, and her craving for food could hardly be satisfied.

The patient whose wound had entirely closed fourteen days after the administration of the serum, is now, three and a half months since the operation, doing her own housework ; she feels well and strong and has more than regained her weight ; upon examination I can find no evidence of any displacement of the refractory kidney.

This report I have thought well to publish as being of interest to those who have been worried, and may again be, by cases such as mine, and to offer to them this small measure of assistance which has proved so beneficial to my patient and so grateful to myself.

SEPTIC THROMBOSIS OF THE LATERAL SINUS WITH REPORT OF FOUR CASES.

BY

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Cases of sinus thrombosis are of more than usual interest, being often among the most difficult of diagnosis, and exemplifying some of the most brilliant achievements of modern surgery.

While in the first place, the condition is time and again mistaken for tuberculous meningitis, typhoid, simple broncho-pneumonia or influenza, at other times there are no signs of any kind, to give evidence of the seat of affection. Typical cases are of course easy to detect, but where no history is given of previous ear disease, or of acute inflammatory disease of the mouth, pharynx or tonsil, the true condition will readily escape the clinician's observation, and what is most important of all a general sepis or suppurative pneumonia may result, because of the fatal delay. When taken in time the surgeon may accomplish, in many cases at least, every success, and for this reason timely detection is a matter of life or death to the patient.

Macewen, in his work on Pyogenic Infective Diseases of the Brain and Spinal Cord, says that "the great majority of cases of infective thrombosis allowed to run their course without treatment, end in speedy death; while cases treated early, by thorough removal of the source of contamination from the sinus and its vicinity offer a reasonable prospect of recovery." This author gives reports of seven cases, of which five were operated upon, with one recovery. Since the publication of his work in 1893, a number of surgeons have reported cases in which operation has been followed by success.

The following series illustrate some typical and other atypical cases whose history is, I think, worthy of record:

Since January 1st, 1894, four cases of septic thrombosis of the lateral sinus were admitted into the Royal Victoria Hospital. Of these, three were operated on with one recovery, the balance died. I am indebted to Drs. Stewart, Bell, and Buller, for permission to publish these cases and to Dr. Adami for the report of the autopsies.

Case I.—*Thrombosis of the Lateral Sinus—Operation—Recovery.* D. K., male, æt 10, was admitted under Dr. Buller, May 18th, 1894, complaining of frontal headache and pain behind the left ear, which began one week previously. In addition to the above he had had some vertigo and there had been elevation of temperature.

For five years there had been a discharge from the ear intermittently and during this period some deafness and considerable distress from noises in the ear.

On examination he was found to be fairly well nourished and healthy looking.

There was evidence of chronic suppurative otitis media in both ears and of a comparatively recent exacerbation in the left ear. The auditory canal contained a small quantity of very fœtid secretion consisting of epithelial debris and purulent material. The floor of the canal was occupied by a polypoid excrescence which half filled the lumen. There was a perforation in both membranæ tympani. The left mastoid was tender on pressure and there was some swelling below the ear and in front of the sterno-mastoid muscle.

The day following admission, Dr. Buller opened the mastoid antrum and evacuated a quantity of pus and caseous purulent material. In following the direction from which the pus came the lateral sinus was opened but very little pus escaped.

There being no change in the patient's symptoms in the following 24 hours, Dr. Bell cut down along the course of the jugular vein and ligatured the vessel above and below, excising the intervening portion. There was considerable infiltration of the structures around the sheath of the vessels and the dissection was difficult. The opening in the mastoid was enlarged, the wall of the lateral sinus exposed and the parts thoroughly irrigated and packed with iodoform gauze. Two days later, on removing the dressings a quantity of foul smelling pus escaped from the lateral sinus, and for nearly two weeks the discharge continued although in decreasing quantities, while with this decrease there was a fall in the temperature and a marked improvement in the general condition. Eventually the discharge ceased altogether and the wound closed up although there still continued a slight discharge from the ear.

Case II.—*Thrombosis of the Lateral Sinus—Cerebral and Cerebellar Abscess—Broncho-Pneumonia—Death—Autopsy.*

E.M., female, æt. 13, was admitted under Dr. Bell, March 19th, 1895, complaining of pain and swelling in the left side of the neck and pain in the left ear, headache and dizziness.

For five years she had a discharge at intervals from the ear, but no acute symptoms until two weeks before admission. She complained of severe headache, followed soon by pain in the ear, and three days later by swelling in the side of the neck with excessive tenderness over the swelling and behind the ear.

On examination she was found to be pale, delicate looking and

poorly nourished. There was a large mass between the angle of the jaw and the mastoid on the left side, which extended downward along the sterno-mastoid muscle. The skin over this was red, œdematous, and very tender, but no fluctuation could be made out.

There was a profuse purulent discharge from the ear, and on account of the pain caused by manipulation, the auditory canal could not be examined. The head was inclined to the left. There had been elevation of temperature for some days, and there was suppuration in the lymph glands on the left side of the neck. Soon after admission the patient had a chill, in which the temperature rose to 105⅘. The skin over the most prominent part was incised and a large quantity of foul smelling pus escaped. Several days later there having been no change in the patient's condition, the mastoid antrum was opened and a quantity of inspissated pus and necrotic tissue found. The opening in the mastoid was enlarged, the lateral sinus exposed and emptied and the whole thoroughly irrigated and a dressing applied. Large quantities of pus continued to be discharged, but the headache persisted and the temperature was markedly septic. Optic neuritis was noted, there was nausea, vomiting and pronounced nervous manifestations, and death occurred one week later.

The autopsy showed great pallor, with a slight yellowish tinge to the skin. There was well marked lividity and rigidity. Through the operation wound, the opening in the mastoid could be seen and from this an opening leading into the middle fossa of the skull and into a cavity in the petrous portion of the temporal bone. This latter was 18 mm. deep and contained purulent material; the roof was membranous and situated on the surface of the petrous bone towards the middle fossa. Beyond this membranous portion, the roof of the channel became thick and deeply situated, running in the petrous bone nearly parallel to the superior border and through the hiatus Fallopii, and was altogether 4 cm. long and of an average breadth of 4 mm. It contained pus save in the last 5 mm. internally, while 20 mm. from the external end it communicated with the cavity of the middle ear, which also contained a considerable quantity of purulent matter. No trace of the tympanic membrane could be found. Over the region of the tympanum there was an area of eroded bone, 10 x 4 mm. in extent. A collection of pus covered the lateral sinus. The dura mater was tense and there was pus between the dura mater and the bone over the left occipital region. The longitudinal sinus contained in front a fairly firm clot, which became blackish towards the posterior part. The outer portion of the left lobe of the cerebellum was the seat of extensive destruction of brain tissue, covered with

dirty pus, and had an area of necrosis extending 3 c.m. into the substance. There was a layer of pus between the cerebellum, and the under surface of the hemisphere. The cerebral tissue was soft, and towards the posterior and outer portion there was an irregular area of destruction, 15 x 5 mm. in extent, and from this a sinus passed upwards and forwards communicating with the posterior limb of the lateral ventricle. The ventricle itself was relatively full of curdy, greenish pus, but it was not distended, while a layer of pus covered the roof of the fourth ventricle. There were firm adhesions of the left pleura from apex to base, and a bilateral lobular pneumonia. The heart, liver and lungs presented the usual signs of cloudy degeneration.

CASE III.—*Thrombosis of the Lateral Sinus—Cerebellar and Pulmonary Abscess—Death—Autopsy.*

W. B., male, æt 12, was admitted under Dr. Stewart, November 24th, 1895, complaining of headache, diarrhœa, pain in the back and abdomen and in the left ear. For one year he had had pain in the ear at intervals, but there never had been any discharge from the meatus. Two weeks previous to admission the patient was first taken seriously ill, while during the second week he was able only with difficulty to turn the head from side to side. On examining his ear, the mother noticed a little puffiness about the mastoid, but no discharge was observed from the meatus. The auditory canal was syringed with hot water, and a poultice applied, on the removal of which a discharge of fœtid, reddish pus was noticed, while the puffiness over the mastoid had disappeared. Headache still persisting he was admitted to the hospital when he was seen to be a delicate looking, poorly nourished lad, with a flushed face and anxious countenance. The lips were parched, tongue heavily coated, teeth covered with sordes, temperature $104\frac{3}{5}^{\circ}$, pulse 92, respiration 24. There was tenderness on pressure about the meatus and mastoid and along the course of the jugular vein. The meatus contained some muco-pus, and there was a perforation in the tympanum. The pulmonary second sound was accentuated and reduplicated. The abdomen was retracted and tender on pressure, especially in the region of the splenic and sigmoid flexures, and the spleen was readily palpable. The urine contained a minute trace of albumen but no casts.

In this case the history of the onset, the headache, and pains in the back, the gastro-interstitial disturbance, the elevation of temperature and the enlargement of the spleen, at once suggested typhoid fever and with it an acute mastoiditis, and it was not until the second day after admission that the diagnosis of septic thrombosis was definitely made.

The subsequent course of events is briefly as follows : On the day following admission there was a slight puffiness and tenderness at the angle of the jaw and the facial muscles were slow in action. During the day the patient had a rigor in which the temperature rose to $104\frac{4}{5}^{\circ}$, and on each of two successive days he had a rigor with elevation of temperature. Following the last rigor he had distinct facial paresis, and in addition a left external strabismus. Four days after admission, he had a clonic spasm of the arms and legs lasting ten minutes. Operation having been recommended, he was transferred to the surgical department, and operated on by Dr. Bell, who made an incision immediately behind the bony meatus, obliquely upwards and backwards. The periosteum was stripped away and the antrum opened with a drill, so that the lateral sinus was thoroughly exposed, with the result that a quantity of foul smelling pus escaped, apparently arising from below. The sinus was well irrigated, packed with iodoform gauze, and the wound dressed in the usual manner. The patient, however, showed but little signs of improvement, the symptoms became more aggravated, the respiration reached 48 per minute, harsh breathing and crepitations were heard over both sides of the chest. Coma supervened on the following day and the patient died 30 hours after the operation.

The autopsy showed marked post-mortem lividity and rigidity. The lower end of the operation wound was open, exposing an area of bone, whitened and necrosed, for a considerable distance around a small trephine opening. The periosteum was loosened over an area 8 x 5 c.m., and on removing it from the balance of the skull cap there was considerable oozing of blood. On removing the skull cap it was seen to be thin ; there was no pus between the dura mater and the bone. The longitudinal sinus contained a loose mixed clot of a greenish colour, and some semi-fluid blood. On removing the dura mater from the right side the convolutions seemed to be flattened and the vessels congested, while on the left side the convolutions were even more flattened. There were no signs of pus between the dura mater and the brain, and there were neither adhesions nor evidence of suppurative meningitis either over the hemispheres or at the base of the brain. In the hemispheres there were no signs of abscess or focal inflammation. The ventricles contained rather more fluid than normal. The outer extremity of the left lobe of the cerebellum was softened and somewhat discoloured, and upon cutting into it an abscess was found, 25 mm. in diameter, containing dark green fluid. The walls of the abscess cavity were smooth, save where it approached the surface. In the left lateral sinus in the neighbourhood of the artifi-

cial perforation, there was greenish pus, which gave place to a thick mixed partly broken down clot, extending backwards as low as the torcular Herophili, forwards and inward along the internal limb of the lateral sinus. Metastatic abscesses were present only in the lungs.

The heart, kidneys and liver presented the usual signs of parenchymatous degeneration.

CASE IV.—*Thrombosis of the Lateral Sinus—Pleurisy—Pulmonary Gangrene—Death—Partial Autopsy.*

L.M., female, æt. 25, was admitted under Dr. Stewart, March 16th, 1897, complaining of chilliness, cough and loss of appetite. Three weeks previous to admission she had what was thought to be influenza, characterised by chills, which occurred every second day and which lasted about five minutes, slight cough, general malaise and weakness. She had had no headache nor had she pain elsewhere during this time, but from her husband it was learned that one week before onset of illness, she had had slight pain in the left ear and a very slight discharge, but she herself regarded this as unimportant. On examination, she was seen to be fairly nourished, but very pale, rather dull and apathetic. The tongue was coated, the lips dry, and the teeth covered with sordes. Temperature 101⅘°. pulse 132, respiration 60. The pulse was regular but dicrotic. There was some deafness in the left ear, and a perforation in the membrana tympani, but no discharge, nor evidence of recent acute exacerbation. There was a systolic murmur at the pulmonary cartilage, and the second pulmonary sound was accentuated. The examination of the lungs showed a few rales in either axilla, and at the bases, while in the right axilla there was in addition a faint friction rub.

The abdomen was moderately distended, there were a few indistinct reddish papules and the spleen was palpable.

The urine contained a trace of albumen and a few casts.

The diagnosis here lay between typhoid fever, pneumonia and septicæmia. In favour of the former were the elevation of temperature, the enlargement of the spleen and the fading spots, but the constitutional disturbance and the general aspect of the patient seemed altogether too grave ; the physical signs of pneumonia were very few, while the temperature, rigor and general condition pointed strongly to septicæmia with secondary involvment of the lungs.

The subsequent course of events was as follows : Four hours after admission the patient had a chill lasting twenty minutes. The following day, in addition to what was noted above in the examination of the lungs, there was dullness at the right base, while the general condition of the patient was worse than on admission. Two days

later the examination of the chest showed marked friction in both axillæ and behind and in addition there were numerous high pitched crackling rales, especially numerous at the right base. The general condition of the patient had become alarming, although, even yet, she complained of no pain, slept fairly and took nourishment and stimulants well, but the temperature ranged from $98\frac{4}{5}$ to $105\frac{3}{5}$, the pulse was rapid, small and weak, the respirations rapid and shallow. On the fourth day after admission the patient complained of pain on pressure over the mastoid, and there was slight discharge from the ear. The general condition gradually became worse, and the patient died on the morning of the fifth day after admission to hospital.

The autopsy showed considerable pallor, but with a slight yellowish tinge to the skin. There was moderate rigidity and well marked post mortem lividity. There was a slight discharge from the left ear. The spleen was large, soft and pulpy. Both pleural cavities contained fluid in small amount, which was thin, turbid, pale greenish in colour and containing a few flakes and a number of leucocytes. The surface of both lungs was generally covered by a layer of lymph, finely ridged and netted. This was wanting over three or four circular patches in the lower lobe of the right lung and over one well marked patch in the left lung. These patches were from 1.5 to 2.5 cm. in diameter and corresponded to areas of subpleural pulmonary gangrene. On section both lungs, but more especially the right, exhibited areas of metastatic abscess formation and gangrene leading to cavitation, these cavities being filled with glairy and foul smelling fluid. The rest of the organ was crepitant and not greatly congested.

The left internal jugular vein in the upper two inches, close to the bone and behind the tonsil, was filled with a thin grumous fluid having a very fœtid odour. This gave place lower down to a well formed clot, while the other veins of the neck were filled with clotted blood.

The heart, kidneys and liver presented the usual signs of cloudy degeneration.

As permission could not be obtained for a full autopsy, the condition of the sinus itself was not ascertained, but it seemed probable from what was found in the vein that the sinus was involved and that the venous condition was an extension of the infective process.

RETROSPECT

OF

CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Repeated Hæmoptyses in Non-Tuberculous Subjects.

DAVID NEWMAN, Glasgow. "Repeated hæmoptyses in non-tuberculous subjects."—*The British Medical Journal*, May 29, 1897.

Under this heading, Dr. Newman reviews his three cases, published in 1890, illustrative of this sign. Then three other cases are added.

Perhaps the strongest point in favour of the correctness of his diagnosis, *i.e.*, that the patients were non-tuberculous subjects, is the fact that under local treatment for a lesion of the mucous membrane discovered by laryngoscopy, the hæmorrhages ceased. He has furnished a report of the condition after several years: 1. After eleven years, perfect health; no recurrence of hæmoptysis. 2. After eight years, no recurrence; no pulmonary disease. 3. After four years, no recurrence; reported well.

The three added cases may be briefly summarized: The first case had cough and repeated hæmoptysis for 17 consecutive months. There was hoarseness with hypertrophic laryngitis. The lungs were negative on several examinations. The left arytenoid cartilage showed a distinct erosion of its mucous membrane. Local treatment was applied and the hæmorrhage ceased, and five years afterwards he reported himself well. The second case had recurrent hæmoptysis for seven years. An attack of pleurisy years before, together with a chronic cough and expectoration, pointed strongly toward tuberculosis of the lungs as the origin of the hæmorrhage, and such a diagnosis was made. On examination of the air passage a "small highly vascular area" was found on the posterior wall of the naso-pharynx. Irritation of this spot induced severe coughing and hæmoptysis. Treatment was applied locally and no recurrence was noted. The patient died from septic renal disease after 8 or 9 years. No signs of old or recent tuberculous disease were found at the post-mortem. The

third case, the sixth of the kind reported by Newman, had repeated attacks of hæmoptysis during eighteen months. He become anæmic and emaciated. Phthisis was strongly suspected, as an area at the right apex presenting diminished resonance and slightly prolonged expiration was detected. However, on examination of the posterior nares the left inferior turbinate bone was found enlarged, and its posterior limit was seen to be the site of a dark reddish copper coloured tumour, which bled very readily. After removal of this growth, with subsequent treatment of the base, the hæmorrhages ceased, and in 1893, nearly three years after the operation, there was no recurrence, and his general health had improved.

W. F. Hamilton.

The Sero-Diagnosis of Typhoid Fever.

" The sero-diagnosis of typhoid fever."—From the proceedings of the recent meeting of the American Medical Society.

The subject was introduced by Dr. W. H. Welch, of Baltimore, who read a very important and interesting paper on " The principles underlying the sero-diagnosis of Typhoid," in which he first briefly referred to the historical aspect of the case, tracing the numerous attempts, most of them unsatisfactory, to obtain cultures of the bacillus typhi from the spleen, rose-spots, blood and stools. In 27 per cent. of cases positive results had been got from the blood, but the method had the disadvantage of requiring a rather large quantity of blood, viz., 10 cc The Elsner method of obtaining cultures from the stools marked an advance in the diagnosis of typhoid fever, but its field of usefulness was too limited.

The principle of Widal's test was that by the addition of one part of blood serum to ten parts of fluid containing the bacilli, a reaction takes place whereby the bacilli lose their motility and clump together. It had been found that the same power was possessed by serum from a blister and the fluid from a serous cavity. It had further been discovered by Dr. Wyatt Johnston, of Montreal, that dried blood was also capable of producing a similar agglutination. It was so far a matter of discussion whether more importance should be attached to the loss of motility or the clumping.

Dr. Welch further pointed out that cultures under twenty-four hours old should be always used, and for his own part was accustomed to recommend those only fifteen hours old.

He indicated that the degree of saturation was of considerable importance and deserved further study. Widal had recommended

saturation of 1:10 or 1:15, but it had been found that strengths of 1:40 or 50 gave better results. In cases where there was a suspicion of an infection with the colon bacillus, it was important to make the test with a weak solution as the colon bacillus had never been known to act with a dilution greater than 1:40.

A source of difficulty also lay in the fact that in some cases the reaction appeared late. In the majority of cases it could be found in the first week, but some undoubted cases failed to give a positive result until the second or third week, and in a few cases the reaction had been absent altogether. He concluded from this that a negative result was not conclusive proof of the absence of typhoid. A third source of error lay in the fact that the blood of persons who had suffered from typhoid fever retained the power of agglutination for a considerable time.

Dr. Wyatt Johnston, of Montreal, whose experience covered 600 cases, more than half being typhoid, then followed. He considered that the alkalinity of the culture was important, as if it were acid the reaction did not take place. He also preferred young cultures. It could only be regarded as a proper reaction when both loss of motility and clumping were present. If either occurred singly the reaction was to be regarded with suspicion.

In a clinical report on sero-diagnosis, Dr. R. C. Cabot, of Boston, cited the following figures from statistics which he had compiled:

In 1826 cases of supposed typhoid, in 95 per cent. the autopsy, confirmed the serum test.

In 1649 cases, not typhoid, 96 per cent. were negative. Total, 3475 cases; 95·8 per cent. confirmed test; 2 were incorrect.

In 101 cases supposed to be typhoid, 96 had given a positive reaction, while 5 failed. Three of these were seen late in the disease. One, seen early, which proved to be typhoid at autopsy, persistently gave a negative result. In 301 cases other than typhoid, 300 gave a negative result; one, a case of pernicious anæmia in a negro gave a positive reaction.

He also concurred in the view that for a true reaction both elements, the loss of motility and the agglutination, should be present.

The length of time during which a patient would show the reaction was still *sub judice*. The longest period reported was 13 years. The reaction also might be intermittent. The susceptibility of the blood of negroes to the reaction was also referred to.

Dr. Bloch, of Baltimore, had found that the earliest date on which the reaction was found was on the sixth day, the first day being considered to be the first on which the patient was obliged to give up

work. 107 examinations in 46 cases of typhoid gave 6.5 per cent. of failures. He pointed out the possibility of making an early diagnosis between typhoid and the various forms of tuberculosis.

The conclusions come to by Drs J. H. Musser and John H. Swan, of Philadelphia, were stated by Dr. Swan to be as follows :

1. That age and sex have no influence.
2. That the reaction could be obtained as early as the 7th day.
3. The reaction disappeared at varying periods after cessation of the disease.
4. The reaction could not be obtained from the blood of patients suffering from diseases other than typhoid.

Dr. Richardson, of Boston, read a paper on " Elsner's Method of Diagnosis in Typhoid Fever." Elsner's gelatin culture medium had first been prepared with carbolic acid, but as a result of later experiments he had been led to substitute iodide of potash. No other bacteria than those of typhoid would grow on this medium. As a result of his investigations he thought that the Widal method was to be preferred on account of its greater simplicity, but suggested that in cases of doubt Elsner's plan of examination of the stools might, with advantage, be tried and would sometimes give a satisfactory result, when the former method failed.

Dr. N. S. Davis, of Chicago, stated that according to his experience 90 per cent. of typhoid gave a positive reaction. The time at which the reaction could be obtained varied and had no relation to the severity of the attack. He considered that the test did not give conclusive evidence.

Dr. J. B. Herrick, of Chicago, gave the experiences of Dr. Weaver, of the Rush College. Several of the cases examined had all the symptoms of typhoid fever and were also tuberculous. In all these the test failed to give a reaction. It was possible that this might be a mere coincidence, but it opened up the question whether the test was applicable to cases of mixed infection.

A. G. Nicholls.

Surgery.

UNDER THE CHARGE OF GEORGE E. ARMSTRONG.

Catheterism of the Ureters in the Male.

MEYER. "Catheterism of the ureters in the male with the help of the ureter cystoscope."—*New York Medical Record*, May 1, 1897.

The value of the information derived from catheterism of the ureters in the female is well established. It has been given a great impetus by Kelly and is now practised somewhat generally. It seemed for a long time as if the anatomical structure of the male urethra with its curve and its situation, through the prostate, would prevent a similar examination of the male ureters. But the difficulties seem to be overcome, and now it is practicable to catheterise the male ureters with almost as much ease as the female.

The principles are, however, different. The male urethra is less dilatable than the female, and it is impossible to balloon the male bladder and catheterise the male ureters through a straight tube as is done in the female, but the same end is attained by the use of instruments that are handled in front of the external meatus of the urethra and the ureteral catheter can be introduced into the ureteral openings under the guidance of our eyes. This operation is best carried out with instruments the principles of which have been laid down by Nitze.

The three cardinal conditions which permit cystoscopy are :

1. The calibre of the urethra must be sufficient to allow the instrument to pass.
2. The bladder must have a capacity of at least four or five ounces.
3. It must be possible to keep the fluid in the bladder transparent.

Now and then these conditions obtain, and yet the method proves unsuccessful owing to the fact that the mouths of the ureters cannot be found, or that they cannot be approached, or that they are two small to allow the entrance of even the finest of catheters. Sometimes the catheter has well entered the ureter, but it soon becomes plugged by descending blood or pus.

Dr. Meyer reports seven cases in which he employed this method of diagnosis with success.

A new and very interesting point discovered in the examination of two of these cases is that a crystalline deposit may descend from one

kidney alone and thus enter the bladder urine. This is apparently a new and original observation by Meyer.

Meyer has done all his work with a Caspar instrument and with cocaine anæsthesia.

Geo. E. Armstrong.

The Treatment of Ulcers and Wounds by Oxygen.

STOKER. "The treatment of ulcers and wounds by oxygen."—*Clinical Society's Transactions*, Vol. XXVIII.

STOKER. "The treatment of ulcers and wounds by oxygen."—*British Medical Journal*, Oct. 24, 1896.

In the above mentioned papers, Dr. Stoker calls attention to the value of oxygen gas applied surgically. He recommends that the gas be used pure at first, but that later in the course of treatment a solution varying from 25 to 75 per cent. is preferable. When it is thought well to lessen the strength of the gas, a current of air which has been passed through bottles, one containing lime water and the other a permanganate of potash solution, is mixed with the gas. By means of the "enclosure," any part of the body may be thus treated. The enclosure consists merely in the appliance adapted to the region of the body which is to be treated, fitted with the necessary openings for the inlet and escape of the gas. It is not necessary that it be absolutely air-tight; on the contrary, it is well that there be free ventilation. The apparatus must, however, be so applied that the current of gas comes in contact with the diseased area. For the treatment of wounds, &c., of the leg, an ordinary oblong wooden box with a glass lid and an india rubber funnel is required. The funnel is secured about the limb. Similarly simple contrivances may be used for the application of the gas to the various other regions.

Dr. Stoker finds that the oxygen treatment brings about healing when every other method has failed; that it produces rapid healing; that it allays pain, checks foul discharges and forms a healthy new skin which is vascular. He records several cases which testify as to its beneficial results, and particularly are these results noticeable in the treatment of chronic ulcer. Some cases which for years had gone the round of hospital and private treatment without benefit, were cured rapidly by the use of the gas.

From Dr. Stoker's experience, he concludes that oxygen has a selective power in reference to micro-organisms, favouring the growth of some and retarding that of others, He considers the staphylococcus albus, and staphylococcus aureus favourable micro-organisms, as they

are found in healthy and rapidly healing wounds under oxygen treatment. In unhealthy wounds, streptococci, bacillus fluorescens, b. foetidus, &c., are found, and these he terms unfavourable micro-organisms. If, in the treatment of the wound by oxygen, the unfavourable micro-organisms are found to predominate, an increase in the strength of the gas solution will be followed by an increase in the number of the favourable micro-organisms with a corresponding decrease in the unfavourable, and a consequent amelioration of the diseased parts. He further considers that the presence and abundant growth of the favourable micro-organisms greatly add to the rapidity of the cure.

E. J. Semple.

Obstetrics and Diseases of Infants.

UNDER THE CHARGE OF J. C. CAMERON.

Case of Recto-Vaginal Fistula from Pressure of the Fœtal Head.

J. A. Doléris et E. Lenoble. "Rupture de la cloison recto-vaginale consécutive à la pression exercée par la tête fœtale chez une primipare à tissus peu résistants."—*La Gynécologie*, 15 Avril, 1897, p. 134.

The patient, æt 22, I-para, entered hospital (La Pitié) under Dr. Doléris on 6th February, 1897, She was small, poorly nourished and presented the group of symptoms described by Prof. Hayem as *chloro-tuberculosis*. Any attempt to make a vaginal examination caused a vaginismus immediately, and she admitted that sexual intercourse was painful. Labour began on 15th March, at 10 a.m., the os was fully dilated at 6.30 p.m., and then the liquor amnii came away. Rotation took place in the excavation, but the progress of the head was arrested by the active resistance of the perineum. Chloroform was given on account of the vaginismus, and forceps applied to the sides of the head, rotation being complete. Delivery was effected without difficulty, and a slight superficial tear of the perineum was closed with two catgut sutures. Two days afterwards, the patient complained that she was passing flatus *per vaginam*, and an enema having been administered, part of the fluid escaped through the vagina. On examination, the sphincter ani and constrictor vulvæ were found to be normal, but 2 centimetres above the anus, a little to the left of the median line, was a small round fistula, with irregular borders, covered with foul-smelling mucus. The same evening the temperature rose and did not become normal again till the 11th day. On the 15th day the operation of perineorrhaphy and radical cure of the fistula was done by Doléris, and the patient made a good recovery.

As regards the causation of the fistula, three hypotheses were possible :

1. It was of old standing, not sufficiently marked to attract attention, but aggravated and made visible by traumatism occurring during labour.

2. It was caused directly by the forceps.

3. It was the result of a difficult labour, produced by the pressure of the fœtal head on tissues of feeble resistance.

The first two hypotheses were untenable, for there was no history of an old fistula, and the forceps blades did not come near the seat of the lesion. The only explanation, therefore, is that in a difficult labour in a highly nervous woman the soft ill-nourished tissues offered but feeble resistance to the pressure of the head increased by the vaginismus even though the pressure lasted for but a short time. This case is interesting from a practical point of view in shewing how important is the condition of the maternal soft parts in the production of lesions in the recto-vaginal wall. Vaginismus causes spasmodic resistance of the perineum, a depression is formed in which the head lodges when it comes down upon the pelvic floor, the tissues which are compressed become paralysed, and fistula may result, or even a central perforation of the perineum.

The Function of the Levator Ani.

W. W. Browning.—"A Contribution to the Knowledge of the Anatomy of the Levator Ani Muscle."—*Medical News*, 12th June, 1897.

Considerable difference of opinion exists among obstetricians and gynæcologists respecting the anatomy and functions of this muscle. Dr. Browning has made dissections in the male and female, both in man and the lower animals. The most interesting from the obstetrical point of view, was the dissection of the pelvic floor over which the head of an eight-months fœtus had passed within 48 hours. There was no evidence of the stretching of the fibres as described and illustrated by Dickinson in his comprehensive article in the *American Journal of Obstetrics*, Sept. 1889. On the contrary the muscle was compact, firm and well developed.

All are agreed that this muscle originates (1) in front, from the posterior surface of the body of the pubic bone on each side of the symphysis ; (2) behind from the internal aspect of the ischiatic spine ; (3) in the interval included between these points from a sort of fibrous arch extending between them, which may be regarded as a thickening on its margin of the obturator fascia.

Respecting the functions of the muscle, the views of Savage have been accepted by some, and those of Von Luschka by others. Savage divides each *levator ani* into two portions, the *pubococcygeus* and the *obturator coccygeus*, which differ in arrangement and function. The former arises from the posterior surface of the pubes and the posterior layer of the triangular ligament. Its fibres pass backward on the side of the lower part of the vagina, and on the side of the anal canal, to the last two pieces of the coccyx. A few fibres turn inward in the

perineal body in front of the internal *sphincter ani*. Behind the anus and in front of the coccyx, the fibres of opposite sides partially blend in the middle line. The *pubococcygei* act as sphincters of the lower portion of the vagina and anus, but can not compress the upper portion of vagina or rectum. They also draw upward and forward the perineal body and coccyx.

The *obturator-coccygeus* arises from the pelvic fascia between the pubes and ischial spine; its fibres run backward and inward to the coccyx. It is a thin layer of muscle which raises the coccyx and can elevate the pelvic floor somewhat, after it has been depressed.

Von Luschka and Dickinson hold that *no* fibres of the muscle reach the vaginal wall; that a few coming from the pubic band and deeper than the rest turn into the perineal body; that most of the pubic fibres unite with their fellows of the opposite side behind the rectum *without the intervention of tendon* and *none* reach the coccyx; that the fibres from the ischial spine are inserted into the coccyx; that those of fascial origin curve downward and backward with varying obliquity and with the concavity forward, to be inserted into a raphe reaching from the rectum to the coccyx. The muscles of the two sides form a sort of funnel-shaped sheet, slung about the rectum posteriorly "hugging the concavity of its end curve."

Dr. Browning's investigations tend to show that Savage's description is more correct than that of Von Luschka, and that Dickinson's illustrations create an entirely erroneous impression. He says there can be no doubt but that the muscle from its insertion into the perineal body, the external sphincter ani, the post-rectal raphe, and the coccyx pulls upward and forward the post-vaginal structures of the pelvic floor, and that traction upon the pubic band everts the anus. In the lower animals the levator ani is more developed in those having a tail, and the function of the muscle in such animals is almost entirely to act upon the tail. He offers the following objections to the claims that the levator ani is the principal support for the pelvic contents of woman;

1. That in the human subject it belongs to the class of rudimentary muscles.

2. That the weakness of its origin as well as the direction and the insertion of its fibres is inconsistent with such design.

3. That it is unphysiologic for a muscle to furnish a continuous support.

4. That the rectovesical fascia is in itself sufficient, when intact, to afford the required support.

5. That the muscle is no better developed in the female (in whom support is most required) than in the male.

Quinine in the Treatment of Incomplete Abortion.

SCHWAB. "De l'emploi du sulfate de quinine dans le traitement de l'avortement incomplet."—*L'Obstétrique*, 15 Mai, 1897.

Considerable difference of opinion exists among obstetricians respecting the treatment of incomplete abortions, the fœtus having been expelled and the placenta remaining wholly or partially in the uterus. Tarnier and his followers advocate expectant treatment, taking care to keep the vagina aseptic, and do not interfere actively to empty the uterus unless hæmorrhage or sepsis occurs. They consider that removal of the placenta by means of the fingers or instruments may cause danger. The fingers may not suffice to detach and extract the placenta completely, placental forceps and the curette may injure or even perforate the uterus and are apt to leave portions of placental debris behind. Tarnier and Budin conclude that incomplete abortion left to itself rarely gives rise to serious complications.

Those who advocate active intervention hold that so long as the placenta or any considerable part of it remains in utero, the patient runs grave risk of hæmorrhage or septicæmia. The hæmorrhage may occur suddenly and unexpectedly, and septicæmia may develop insidiously. The placenta, which is partially detached and is retained *in utero*, putrefies rapidly. They do not advise waiting longer than six hours for the natural expulsion of the placenta. They begin with hot vaginal or intrauterine douches, then apply the intrauterine tampon or endeavour to separate the placenta by means of the fingers; if these measures fail, they use the curette. If hæmorrhage or sepsis occurs, they remove as much as possible by the fingers and then curette thoroughly.

Others distinguish between the treatment of incomplete abortion in hospitals and in private practice. In the former, where the patient is under constant supervision and where douching can be readily and systematically employed, the expectant plan may be tried. But in private practice, where the patient is not under such careful supervision, hæmorrhage and sepsis are more to be feared and immediate emptying of the uterus is safer practice. When the fœtus is dead and macerated, infection is more apt to occur rapidly, and the expectant treatment is so much the more dangerous.

In 1888, Cordes (Geneva) called attention to the ecbolic action of quinine. Schwab used it in seven cases of incomplete abortion in the Lariboisière and Saint-Louis Hospitals in Paris, in the service of

MM. Magnier and Tissier. Given in doses of 1 gramme (15 grains) in two cachets of half a gramme each, at an interval of 10 minutes, quinine set up sharp uterine action. It acts as an ecbolic when the uterine muscle has already been in a state of contraction, but it differs from ergot in being harmless, in not producing tetanic contraction of the uterine muscle or provoking a contraction of the uterus *en masse*, the cervix included. There is not the same danger of increasing the chances of placental retention, as when ergot is employed. Schwab draws the following conclusions ;

1. The retention of the after-birth in abortion being always a serious complication, whether simple or accompanied by hæmorrhage or sepsis, we should endeavour to secure its expulsion as soon as possible.

2. Placental retention is always a menace to life from hæmorrhage or infection, consequently strict antiseptic precautions should be observed.

3. Digital or instrumental intervention to empty the uterus may be insufficient or dangerous.

4. Quinine, 1 gramme in divided doses, has a manifest action upon uterine contractility, and may, therefore, be suitably employed as an ecbolic to detach the placenta in abortion.

5. Unlike ergot, it is harmless in all cases ; if it fails, the expectant plan or active intervention may be tried.

6. It should be prescribed if simple placental retention has lasted for six hours ; sooner, if there is hæmorrhage or fever.

7. The administration of quinine should be the first step of active treatment, when rapid emptying of the uterus is indicated.

Formaldehyde as a Disinfectant.

H. C. Wood. "Formaldehyde."—*University Medical Magazine*, June, 1897.

In an interesting article upon the properties and uses of formaldehyde, Dr. Wood throws out a suggestion to surgeons, that it may be possible by means of the simple formaldehyde lamp to immediately disinfect wounds by allowing the vapour to be discharged for a few moments into the wound. The penetrating character of the vapour is such that it seems probable that it would penetrate into the recesses of the wound much better than would a liquid solution. In bad cases of general peritonitis, laparotomy is almost invariably followed by death. Dr. Wood suggests that the rapid disinfection and purification of the whole abdominal cavity by a gaseous and seemingly scarcely toxic vapour, might possibly open out an avenue of safety. In cases of septicæmia, where thorough disinfection of the uterine cavity is

essential, it seems that formaldehyde vapor is worthy of trial. Formalin is the trade-mark name of an aqueous 40 per cent. solution of formaldehyde. Under the name *Formaldehyde*, Messrs. Merck & Co., supply an aqueous solution of the same strength at a cheaper price than formalin. It is only feebly toxic, and may be used with far less danger than corrosive sublimate or carbolic acid for intra-uterine and intra-abdominal disinfection. Besides its germicidal properties, it is one of the best deodorants and does not in any way affect instruments. In the disinfection of cutting instruments, it may prove more convenient than boiling, which dulls the edges. Dressings and vulvar pads might be thoroughly and quickly sterilized by allowing a current of formaldehyde vapour to pass through them. For washing out and purifying infected wounds, Professor Willard uses a 2 per cent. solution; for continuous local application or for free irrigation a quarter of a 1 per cent. solution. Winckel finds it valuable in gonorrhœal vaginitis and other infective diseases of the genitals; he paints a 4 per cent. solution upon the infected cervix, but finds a solution of 1 in 10,000 sufficient for irrigation.

J. C. Cameron

Pharmacology and Therapeutics.

UNDER THE CHARGE OF A. D. BLACKADER.

On the Action of Strophanthus.

Wood, H. C. "Lectures on Therapeutics; Strophanthus, Caffeine, &c." —*Boston Medical and Surgical Journal*, Vol. CXXVIII, No. 21.

Wilcox, R. W. "Strophanthus: a Clinical Study."—*American Journal of Medical Sciences*, May, 1897.

Macgregor, A. "Two Cases of Œdema of the Lungs in Children treated with Strophanthus."—*The Lancet*, March 13th, 1897.

Strophanthus up to the present does not appear to have realised clinically the expectations that were raised among the profession after the brilliant studies on its action, carried out by Prof. Fraser, of Edinburgh. Employed originally by the natives of Africa as an arrow poison, it was shown by Fraser that it acts not only on voluntary muscle, but affects promptly and powerfully the muscle of the heart. This action at first consists in increasing the elastic tone of the muscle so that the individual fibres expand more slowly, and contract more completely. As the effect deepens, this tonicity increases to a stiffness which may finally terminate in a fatal rigidity, if the dose be sufficiently large. The cardiac muscle appears to be peculiarly sensitive to the action of this drug, responding to doses which scarcely affect the muscles of voluntary movement, and the result obtained is, according to Prof. Fraser, a very powerful one, exceeding far the effect produced by any other cardiac stimulant. One part of the dry alcoholic extract in ten million parts of water, he tells us, causes extreme systolic contraction in the living heart of a frog in fifty minutes, while the most active of the soluble principles of digitalis have but little effect in a solution of one in fifty thousand. On the other hand, the solution of digitalis exerts an influence on the muscular coat of the arterioles fifty times exceeding that of a similar solution of strophanthus.

In small doses the drug produces only slight gastric irritation, and may as a bitter even stimulate digestion; in toxic doses, however, it gives rise to considerable gastric distress, followed by purging and diuresis. The action on the kidneys would appear to be a direct one and not due simply to the rise in blood pressure. In experiments

with the oncometer it was found that strophanthus greatly increased the flow of urine from the kidney without increasing the bulk of the kidney, that is without increasing the amount of blood in the kidney, evidencing that it directly affects the secreting structure (Wood). Unlike digitalis, however, it appears to have no stimulant action on the pneumogastric nerves, which many regard as the trophic nerves of the heart. The active principle of strophanthus is very soluble dissolving in less than its own weight of water, and although a glucoside, possesses the diffusibility of a soluble crystalloid. Hence it can be rapidly absorbed into the blood, and rapidly eliminated by the urine; elimination, however, appears to proceed somewhat slower than absorption, a fact which may permit to a certain extent of accumulation in the system, if the drug is administered too frequently.

Comparing its physiological action with that of digitalis we note that strophanthus acts more promptly and more powerfully on the heart muscle, slowing and strengthening the pulse, and raising blood pressure, but its effects are less permanent, and as it has little or no influence upon the calibre of the blood vessels the effect on the blood pressure and pulse is seldom as marked as that of digitalis; the nutrition of the heart muscle appears to be less influenced by strophanthus than by digitalis; strophanthus has a distinct diuretic action, acting as a stimulant to the renal epithelium as well as by increased blood pressure; lastly, in small medicinal doses strophanthus may not only prove less of a gastric irritant than digitalis, but may even act as a bitter stomachic.

A drug with such a well defined action should give us in suitable cases good results clinically; nevertheless, the reports of different observers have so far been very contradictory. In a discussion on the subject of cardiac therapeutics, at a meeting of the Edinburgh Medico-Chirurgical Society, Prof. Fraser strongly urged the value of strophanthus as a cardiac stimulant. Prof. Balfour, on the other hand said of it, "Strophanthus is the only member of this group which has any pretension to rival digitalis, yet it is so much more uncertain in its action, and so devoid of tonic properties that we are seldom tempted to displace digitalis by it." We have therefore read Prof. Wilcox's article with much interest. Dr. Wilcox is of the opinion that many cases of failure to obtain good clinical results are due to the use of a tincture prepared from a different species of strophanthus to the official. He reports in detail a number of cases, giving sphygmographic tracings in which from the use of a carefully prepared tincture in moderate doses he obtained a more speedy relief of the symptoms than can ordinarily be expected under the employment

of digitalis. He says that he has found it of much value in the cardiac asthenia of corpulency, and in that of chlorosis and other forms of anæmia; in the so-called irritable heart, relieving pain and palpitation; in debilitated hearts associated with dyspeptic symptoms, and particularly with flatulence; and in the aged, where vertigo is often the result of cerebral anæmia. In the last class of cases his experience differs from that of Balfour who does not find this remedy serviceable in the conditions met with in advanced life.

The indications for its employment may be stated as follows: (1) In rapidly acting hearts with systole of lessened force and irregular rhythm. Strophanthus strengthens the ventricular contraction, slowing the pulse rate and lengthening the diastole; the irregularity of rhythm disappears and with improved nutrition a permanent strengthening of the heart muscle ensues. (2) In some cases of permanent high tension with a failing heart, such as are met with in Bright's disease, in arterio-sclerosis, and in the rigid arteries of the aged, strophanthus, owing to its comparatively slight action as a vasoconstrictor may give good results. (3) In urgent cases where a prompt action is desired, a single dose usually produces in from half an hour to an hour a fall in the frequency of the pulse with a distinct increase in its force, effects which last from four to eight hours. (Wood). (4) In cases where a diuretic action is desired. As its action is entirely upon the muscular tissue of the heart, it will prove of no avail in cases of advanced degeneration of the myocardium.

Dr. Wilcox is thoroughly in accord with Hare in acknowledging its value in the cardiac diseases of children. Dr. Macgregor reports two interesting cases illustrating its prompt action in acute œdema of the lungs in children. In the first, a lad of seven years suffering from chronic peritonitis and pleurisy, œdema of the lungs developed suddenly with lividity and intense dyspnœa. Ammonia and digitalis appeared to give little relief but strophanthus brought about marked improvement in the distressing symptoms. The second case occurred in a girl of nine years suffering from acute nephritis following scarlet fever. Under the influence of strophanthus the patient made a rapid and complete recovery.

On Alarming Cerebral Symptoms Produced by the Use of the Bromides.

Mitchell S. Weir. "On the Exceptional Effects of Bromides."—*Transactions of the Association of American Physicians*, Vol. XI., 1896.

HARE, H. A "Some of the Untoward Effects Produced by the Administration of the Bromine Compounds."—*Therapeutic Gazette*, June 15th, 1896.

In a very interesting paper read before the Association of American Physicians last year, Dr. Mitchell called attention to the occasional occurrence, under the use of the bromides, of grave mental disturbance. The ordinary untoward effects of these drugs manifested in eruptions on the skin, mental torpor and the development of a profound cachexia, with general enfeeblement, are sufficiently well-known to all. Very occasionally, however, symptoms manifesting themself in great irritability of temper, suicidal or homicidal tendencies, or delusions, are met with as the result of their employment. In some instances these alarming symptoms appear not to be due entirely to the drug, but to be associated, to some extent, with conditions in the patient. The prodromes or consequences of an epileptic fit may, because of the bromides, be intensified even in cases where the attacks are lessened in number. The menstrual wave in women occasionally appears to predispose to these symptoms ; the irritability or melancholy occasionally present at this time has, in a few instances, been much increased by the use of a bromide salt. Cerebral lesions produced by traumatism may also unfavourably affect the action of these medicines, and necrotic changes in the brain due to emboli or thrombi, have appeared to favour the development of these unusual symptoms.

In illustration of these statements, Dr. Weir Mitchell mentions the case of a girl of 15 years, the subject of attacks of Jacksonian epilepsy who, under the influence of 150 grains of the bromide per day, became in ten days an apparent imbecile. She was unable to stand, and when seated her head dropped forward, the eyes were a third open, the pupils large, the sphincters relaxed, and the saliva flowed from the fallen jaw. As to her mind, she was quite imbecile, hard to arouse, and stupidly indifferent. The general convulsions had ceased, but the lesser fits were quadrupled in number. A few days without the bromides entirely restored her to normal condition of body and mind, and the state of partial idiocy was exchanged for a normal condition of rather unusual intelligence.

In another case, large doses in a few days brought two children into a condition of extraordinary feebleness of mind and body, with a peculiar impairment of the memory in both. One forgot the letters of the alphabet, and so could no longer read ; the other had a curious confusion as to the time of events, misplacing them. The symptoms in

both passed away completely within two days of the withdrawal of the bromides.

In another instance, a lady, aged 47 years, the wife of a physician, had for four years taken a daily dose of sixty grains of the mixed bromides. The medicine did not trouble her, nor was there the slightest sign of acne. For twelvemonths, for the few days preceding and during the period of the menstrual flow, she was profoundly depressed and had suicidal impulses. The mid-interval was free from this symptom. At Dr. Weir Mitchell's advice the drug was abandoned, and to her surprise she soon lost her depressing melancholia.

Mere irritability of temper, occasioned by the bromides, Dr. Weir Mitchell thinks, is not very uncommon. He mentions several instances and adds, "In old epileptics, this symptom is laid to the score of the disease ; but that it is not always of this parentage is a matter worth remembering in extreme cases."

He mentions also several instances of epileptics in whom even a few doses of the bromides produced dangerous symptoms. The patients grew sullen, or violent, or dangerously homicidal. In another, a lady in middle life, suffering from some disturbance of general health and loss of sleep, under the advice of Prof. Charcot, was given bromides. Very soon she became excited and wildly delirious. On the withdrawal of the bromides these distressing symptoms ceased.

Dr. Hare, in his paper, relates other instances in which the exhibition of even very moderate doses produced symptoms of mental aberration. With the hope of gaining additional information about such unusual manifestations of the action of these drugs, he addressed a letter to a number of well-known alienists and neurologists, asking them for their experience in connection with the administration of the bromide salts. While many of his correspondents had not met with any cases of excitement produced by the bromide salts, several had. Among the replies received, the following are of interest : Dr. Brush stated that while he could not recall a single instance in which mental alienation or true delusion followed, or was apparently caused by bromides, if the patients were of a sound mind before the drug was given, yet it was common in institutions to receive cases, clinically resembling cases of confusional insanity, in whom the symptoms rapidly cleared up on discontinuing the bromides, and prescribing a more generous diet. Dr. Alison said there was a condition of excitement which he believed was produced by the excessive use of bromides combined with chloral, in persons who were not epileptics, but who were simply suffering from mental disturbance, constipation and loss of

nourishment. The histories in such cases often showed that the patient had been systematically drugged with large amounts of both bromide and chloral, and that too little attention had been paid to other features of the disease.

In the discussion which ensued on the reading of Dr. Mitchell's paper, Dr. Hare emphasised the depressing action of the potassium base in the administration of large doses of that salt, an action which is not shared by the sodium salt.

A. D. Blackader.

Canadian Medical Literature.

UNDER THE CHARGE OF KENNETH CAMERON.

[The editors will be glad to receive any reprints, monographs, etc., by Canadian writers, on medical or allied subjects (including Canadian work published in other countries) for notice in this department of the JOURNAL. Such reprints should preferably be addressed to Dr. Kenneth Cameron 903 Dorchester street, Montreal.]

PERIODICALS.

MAY, 1897.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Fibroid tumours—Dr. Shaw, Clinton, Ont., p. 393.
Ovarian cyst ending in suppuration—A. B. Stewart, Duck Lake, N.W.T., p. 396.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Trophic changes, arrest of growth and interstitial alteration of structure consecutive to violent trauma—T. E. Manley, New York, p. 189.

MARITIME MEDICAL NEWS.

Notes on cases of midwifery—R. S. Black, p. 153.
Impaired voice-power—J. E. McIntosh, St. John, N.B., p. 158.

LA CLINIQUE.

Cours pratique de chirurgie des voies urinaires—A. Guépin, Nantes, p. 367.
L'infection gonococcique, vulvo-vaginite des petites filles—Dr. Camous, Nice, p. 374.
Faits clinique de l'iridérémie—Jebin Prume, Montréal, p. 380.

JUNE, 1897.

THE CANADIAN PRACTITIONER.

The President's Address, delivered at the meeting of the Ontario Medical Association, Toronto, June, 1897—John W. Coventry, Windsor, p. 391.
The present status of serum therapy—R. Ferguson, London, Ont., p. 398.
The diagnostic value of knee-jerk—D. Campbell Meyers, Toronto, p. 408.

THE CANADA LANCET.

Antitoxine immunization—Perry G. Goldsmith, Toronto, p. 479.
Ovariotomy—operation under difficulties—recovery—Alex. Forin, Rossland, B.C., p. 485.

THE CANADIAN MEDICAL REVIEW.

Should the medical profession of Ontario be self-governed—J. W. McLaughlin, Bowmanville, Ont., p. 209.
Hystero-epilepsy—J. E. Forfar, Toronto, p. 216.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Difficult labours—D. G. Fleming, Chatham, Ont., p. 481.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Crime and criminals—A. B. Eadie, Toronto, p. 235.
Prostatic hypertrophy—T. H. Manley, New York, p. 238.

THE MARITIME MEDICAL NEWS.

Experimental research on the properties of antipyrine—Andrew Halliday, Shubenacadie, N.S., p. 189.

The ductless glands in therapeutics—L. M. Silver, Halifax, N.S., p. 198.

Diphtheritic croup—M. Chisholm, Halifax, N.S., p. 201.

Recurrence of rash in scarlet fever—L. R. Morse, Laurencetown, N.S., p. 203.

L'UNION MÉDICALE DU CANADA.

Quelques suggestions pratiques au sujet des tubes du Crookes—A. A. Foucher, Montréal, p. 321.

L'Anthropométrie—L. H. Roy, Montréal, p. 324.

Cancer primitif de l'æsophage—M. T. Brennan et A. Ethier, Montréal, p. 335.

Pleurésie purulente à pneumocoques (pneumonie lobaire gauche épanchement purulent consécutif, mort)—E. P. Benoit et T. Parizeau, Montréal, p. 340,

BRITISH MEDICAL JOURNAL (JUNE 5TH).

Observations on broncho-biliary fistula, with report of two cases—J. E. Graham, Toronto, p. 1397,

Remarks on a case of pancreatitis followed by cyst of the pancreas—Alexander McPhedran, Toronto, (illustrated), p. 1400.

Clinical lecture on hæmaturia—F. R. Eccles, London, Ont., p. 1402.

A clinical lecture on the treatment of diphtheria—John Herald, Kingston, Ont., p. 1403.

Three cases of Friedreich's disease, all presenting marked increase of the knee-jerk—George Hodge, London, Ont,, (illustrated), p. 1405.

A respiratory symptom of tobacco poisoning and its experimental investigation—William S. Morrow, Montreal, (with tracings) p. 1406.

Aikin's hoop-iron splint in fractures of the humerus—Geo. A. Peters, Toronto, (illustrated), p. 1409.

Intubation and antitoxin—J. C. Connell, Kingston, p. 1410.

A case of malignant pleurisy—J. T. Fotheringham, Toronto, p. 1411.

Aikin's Hoop-iron Splint in Fractures of the Humerus—George A. Peters.

This splint had been used with much satisfaction for many years by the inventor, the late Dr. W. T. Aikins, of Toronto,and by a large number of his old pupils, but a description of it has never been placed on record. The material used is the ordinary band or hoop-iron, one inch wide for young children, and from one and a quarter to two inches wide for an adult. The material can be shaped by hand or by a pair of pliers or monkey-wrenches. It is, at first, so bent and twisted that an arch is formed over the top of the shoulder, the anterior limb reaching downwards over the front of the chest in a direction approximately towards the umbilicus, and may be from 8 to 12 inches in length. The posterior limb forms the vertical part of the splint, and passes down the back part of the shoulder and arm to a point about an inch below the point of the bent elbow. At this level the iron is again bent somewhat obliquely so as to pass under the forearm in a direction towards the mid-line of the body. The splint, thus, almost forms a triangle, the sides of which, however, do not lie in the same

plane. The distinctive feature is that the distance from the shoulder arch to the bend at the elbow should be such that when the arch is fixed in position by strapping, considerable extension can be made on the muscles of the arm by drawing the forearm down to the horizontal limb of the splint below the elbow. In applying the splint, after being well padded, it is placed with the arch over the shoulder and secured very firmly (but quite free) by one or two strips of rubber adhesive strapping about an inch and a half broad, and long enough to reach well down upon the back and front of the thorax. For the sake of additional security, one or both straps may be given a turn round the top of the arch. Similar straps are made to embrace the anterior limb of the arch, and pass horizontally round the thorax. A moulded splint for the upper surface of the forearm should be very carefully padded and fitted and then bound down to the horizontal limb of the splint by strapping, thus setting up very effectual counter extension. If desirable short coaptation splints may be applied over the fracture.

The advantages claimed for the splint. It is the only splint described which furnishes in itself the means of making effectual extention of the muscles of the arm.

It is cool, light, and affords ready means of examining the parts during healing, with the minimum of disturbance.

It permits the direct application of evaporating lotions or the cold coil where indicated.

In compound fractures, ready access may be obtained to the wounds, and if the iron of the splint be brushed over with melted paraffin, it can be readily rendered aseptic and lotions and discharges leave it unaffected.

A Case of Malignant Pleurisy—J. T. Fotheringham.

The case was a man of 56, who complained of shortness of breath on exertion. There were present the ordinary signs of a large effusion in the right pleural cavity. The heart was much displaced downwards about an inch, and to the left as far as the anterior axillary line. This malposition it retained with very little change to the last. The patient had never had any pleuritic pain at any period of his illness. The physical signs presented during the first half of his illness were diametrically the opposite of those seen during the later stages. In the latter half, while the heart remained fixed in its malposition, the hypertrophy of the left lung and the gradual compression of the right, with the failure of the effusion to return gradually changed the physical conditions to be seen in the thorax

so that in place of the full bulging, immobile right thorax of large effusion, one saw the small collapsed fixed chest wall of cured empyema, a chronic cirrhotic disease of the lung. This marked change in general appearance was due to two causes, first, the non-return of effusion after aspiration ; and, secondly, the scirrhotic contracting growth which was found *post mortem* spreading *en cuirasse* over the whole pleura and compressing the lung to much less than its ordinary size.

Reference is made to two cases, almost exactly similar, described by Delafield in his *Text-book on Pathology*, and to his bibliographical references which make it plain that primary new growth in the pleura does certainly occur.

Kenneth Cameron.

Reviews and Notices of Books.

A Treatise on Surgery. By American Authors. Edited by Roswell Park, A.M., M.D. Volume II. Special or Regional Surgery. 8 vo. pp. 768, with 451 engravings and 17 full page plates in colours and monochrome. Philadelphia and New York: Lea Brothers & Co., 1896.

The publication of this volume, completes practically three works on Surgery by American authors within a year, viz., "The Text-Book," edited by Keen and White, and "The System," edited by Dennis and Billings. In size it stands midway between "The Text Book" in one volume and "The System" in four volumes. This is a source of strength and weakness. It is shorter, more quickly referred to and more terse, but also less complete in detail in many subjects.

Like the first volume, it bears a strong impress of its editor, who has contributed the chapters on surgical diseases and injuries to the head; chancroid and venereal ulcer, and that on skiagraphy, or the application of the Roentgen rays to surgery.

Many articles are defective because of what is not said rather than because what is said is not correct. In the article on hernia for example, only a mention is made of Macewen's method of treating the sac. Even a student preparing himself for examination before any Board of Surgeons should know the details of the operation. The whole subject of fractures is disposed of in about fifty pages. The surgery of the gall-bladder and gall-ducts is not fully given. In fact, one who attempted cholecystotomy or a choledochostomy, with only such information as is given, would be in a sorry plight before he was through. Hypospadias and epispadias receives less than two pages, including illustrations. Cæsarean section and symphyseotomy are not mentioned, and one searches in vain for the descriptions of the modern high operations for cancer of the rectum as performed by Heinicke or Hegar or Rehn.

The work will prove disappointing as a book of reference, and will be found too incomplete in detail for students. G. E. A.

The American Year Book of Medicine and Surgery; being a yearly digest of scientific progress and authoritative opinion in all branches of medicine and surgery drawn from journals, monographs and text-books of the leading American and Foreign authors and investigators. Under the general editorial charge of George M. Gould, M.D. Large 8vo. pp. 1183. Philadelphia: W. B. Saunders, 1897.

This volume gives evidence of very careful preparation and wide reading. The chapter on general medicine contains a review of the progress made in the United States and other parts of the world during the year,

and by a judicious mixture of essays and illustrative clinical reports, is made most readable and instructive. The chapter on diseases of the stomach will be read with very great interest. It contains a *resumé* of the more recent advances in our knowledge of the diseases of this important viscus as well as a description of the different methods of investigating and treating them.

In the chapter on general surgery are many most valuable articles. The new methods of antiseptic wound treatment are described. The article on anæsthetics and anæsthesia is particularly good. Gallstone-surgery is treated very fully, and the different operative procedures described, their relative merits compared and the more recent advances indicated. Fractures receive full attention, and several illustrations of different methods of treatment are found. A *resumé* is given of Krause's report on the ambulatory treatment of fracture. A most interesting article is the one on military surgery.

Obstetrics receives, as it should, a careful review. Twenty-two pages are devoted to maternal and fetal dystocia.

Gynæcology, of course, is always very much in evidence, and in the article on this subject the more scientific aspect receives the fullest consideration at the expense of less important details.

Pathology is dealt well with in 46 pages, and is most instructive.

Most interesting and instructive are the articles on pediatrics and infectious diseases, nervous diseases, orthopædic surgery and ophthalmology.

Such a book is exceedingly helpful ; it is a necessity of the times in which we live. G. E. A.

Lectures on the Treatment of Fibroid Tumours of the Uterus, Medical, Electrical and Surgical. By Franklin H. Martin, M.D. Chicago : The W. T. Keener Co., 1897.

Dr. F. H. Martin has written a very complete monograph upon the modern treatment of uterine fibroids, although the English is not exactly what one would expect from a man of the author's high standing in the professsion. Another objection is the adoption of the phonetic method of spelling, which ought to be frowned down upon by all educated people, as our present method of orthography gives not only the correct spelling, but also the derivation and meaning of the words. The following are examples of the spelling used in the text, viz., " fiber," " center, " feces," " valerinate," (the latter being the result of careless pronunciation of the word valerianate, the *a* following the *i* not being sounded) etc.

A useful anatomical classification of uterine fibroids into sub-mucous, interstitial, intra-mural and sub-serous, is adopted by the author.

The description of the macroscopical character of these growths is excellent, as is also the article upon the local examination of the abdomen and pelvis, although no mention is made of auscultation of fibroids for the souffle, except quite casually in the differential diagnosis between pelvic cysts and fibroids.

The author's advice against the two free use of chloral and opium should be taken to heart by those who are fond of prescribing these drugs without reflecting upon the possible future consequences.

The electrical treatment of fibroids is very fully described, and is advocated for suitable cases, viz.: "1. Bleeding fibroids in women approaching the menopause; 2. All inoperable cases; 3. In incipient fibroids in women over 40 years of age; 4. In bleeding fibroids of the smooth interstitial variety; 5. In all cases (not accompanied with pelvic pus accumulation) which refuse to have an operation."

Drainage in abdominal section receives careful consideration, although it is somewhat of a surprise to find that the author advocates the removal of fluid from Keith's tubes by means of a suction apparatus, as this method has been abandoned by the vast majority of operators. Another recommendation with which few will agree is that of changing the abdominal dressing, even in closed aseptic wounds, in four days after the operation, and, at the same time, washing the wound with alcohol and sublimate. Unless there is evidence of infection of the wound, it should not be disturbed for ten or twelve days, when the stitches should be removed.

Altogether, the book is a good *resumé* of the treatment up to date of fibroid tumours of the uterus, and contains a very clear description of vaginal ligation of the uterine arteries and their branches in the treatment of uterine hæmorrhage and tumours. F. L.

A Text-Book of Genito-Urinary Surgery and Venereal Diseases. By J. William White, M.D., Professor of Clinical Surgery in the Medical Department of the University of Pennsylvania, and Edward Martin, M.D., Clinical Professor of Genito-Urinary Diseases in the Medical Department of the University of Pennsylvania. Illustrated with two hundred and forty-three engravings and seven coloured plates. Pp. 1081. J. B. Lippincott Company, Philadelphia. Charles Roberts, Montreal.

The publishers state that "The aim of the book is to be concise, lucid, thorough, and modern—to give the best," and the authors have succeeded in their task. They have given us a book which really covers the ground, but they do not enter into useless discussions and so confuse the reader. The treatment of the various diseases is described clearly and in a manner that will commend itself to all; great stress is laid on antisepsis in all operative work, especially in such procedures as "passing of catheters," where the need of cleanliness is emphasised as the principal means of preventing urinary fever. In speaking of stricture, the theory of stricture of large calibre is not entertained, but these narrowings are called by their right name, points of physiological narrowing. In describing the situation of the stricture the writers follow Sir Henry Thompson rather than Otis, and give as the common site the bulbo-membranous urethra.

The most modern treatment, both of diseases of the ureters and of the prostate, is given, in the latter, the relative advantages of the various operations being discussed. And so all through, all subjects of interest are discussed in a bright, and readable manner, while at the same time, the essential facts are all given. The type is large and clear, a not unimportant matter in these days when so much reading has to be done. The illustrations are well chosen and show what they are intended to show. Altogether it is a work to be strongly recommended. R. C. K.

The International Medical Annual and Practitioner's Index. By Forty-one Contributors. Pp. 637. 1897. Fifteenth year. New York : E. B. Treat. Toronto : J. A. Carveth & Co.

The plan of this work is quite different from that edited by Gould. Part I. is devoted to new remedies, and it is well done. The number of new remedies brought forward each year is so numerous and their variety so great, that a work of this kind, bringing their composition, physiological and therapeutic action before the profession in tabulated form is a necessity. The general practitioner and the specialist will find here brief and concise reports of these remedies that cannot but prove to be of great assistance. Splendid work has been done in this department of medicine during the past year, and therapeutics is rapidly approaching a more exact science than formerly. Part II. deals with new treatment. It is a dictionary of new treatment in medicine and surgery. The name of the writer on each disease is given. The diseases are arranged alphabetically. A busy man can easily turn up any disease that he wishes to refer to readily, and in a few moments get a short report of the advances made in treatment during the year. Part III. includes a very good article on sanitary science by a recognised authority. It treats of several important subjects in sanitation and is well illustrated. At the conclusion is a chapter on new inventions, illustrated. No practitioner can afford to be without such a book. G. E. A.

Lectures on Pharmacology for Practitioners and Students By Dr. C. Binz. Translated from the second German edition by Arthur C. Latham, M.A., M.B., Oxon. London : The New Sydenham Society. 1895-1896.

We have read with much interest and profit these two volumes, translated and published under the auspices of the New Sydenham Society. Pharmacology has no clearer or more scientific exponent of its truths than the writer of these volumes, and we can cordially recommend them to our readers. At the same time we would call attention to the very excellent selection of classical works which are being published by this society. The selection for 1896 contains, besides the lectures which we noted above, a Treatise on Cholelithiasis, by Prof. Naunyn, and Essays on Leprosy. A. D. B.

On Deafness, Giddiness and Noises in the Head. By Edward Woakes, M.D., Lond., assisted by Claud Woakes, M.R.C.S., L.R.C.P. Fourth Edition. London: H. K. Lewis, 136 Gower Street. 1896. (All rights reserved.)

This, the fourth edition of Dr. Woake's work on deafness, giddiness and noises in the head, forms very interesting reading. It has been considerably enlarged and rewritten almost entirely since the third edition appeared years ago.

It is an elaboration of Dr. Woakes' ideas on these symptoms, based upon the theory of correlation of tissue areas.

This theory certainly does account for the phenomena in certain cases but one can hardly follow Dr. Woakes to the extreme that he goes.

To enter into any detailed description of this work would be too extensive for this article.

The above will, however, suffice to indicate the lines on which this book is written.

The book itself has a few illustrations and is otherwise brought out in H. K. Lewis' usual good style. J. W. S.

Feeding in Early Infancy. By Arthur V. Meigs. Philadelphia: W. B. Saunders. 1896.

This small brochure is a clear exposition of the views which have been so strongly urged at various times during the past fourteen years by the writer. The key-note, he says, to the successful feeding of infants lies in the appreciation of the fact that human milk contains only about one per cent. of casein, and that if cow's milk, which contains three per cent., is to be used as the basis of the food, it must first be fittingly diluted, and then other changes be made to bring the various constituents to the same percentage as they exist in human milk. While we must differ from the author in believing that the amount of casein in human milk is always in the neighbourhood of one per cent., we know by experience that his directions make a good working formula with which to feed infants. We have pleasure in recommending the article to those of our *confrères* who are interested in the subject. A. D. B.

The Ready Reference Handbook of Diseases of the Skin. By George Thomas Jackson, M.D., (Col.) Professor of Dermatology in the Women's Medical College of the New York Infirmary, etc., etc. Second Edition. Lea Brothers & Co. 1896.

This book, the first edition of which appeared in 1892, deals mainly with the symptomatology, diagnosis and treatment of disease. The arrangement of diseases in alphabetical order, although of advantage for ready reference, renders the study of the diagnosis of a doubtful case much more difficult, allied diseases not being grouped together. G. G. C.

Transactions of the Association of American Physicians. Vol. XI. Philadelphia. 1886.

This volume, both in the number and excellence of its papers, is fully equal to any of the previous volumes. Among the more important we notice the following: Leukomain Poisoning, by B. K. Rachford; Habit-Chorea, by Wharton Sinkler; Periodical Neuralgias of the Trigeminal Nerve and their relation to Migraine, by J. J. Putnam, of Boston; Tricuspid Stenosis, by George Doch; Syphilitic Nephritis, by H. A. Lafleur; Meschal Buttons, by D. W. Prentiss and F. P. Morgan; Diagnosis of Dilatation of the Stomach, by William Pepper and Alfred Stengel; Notes on X Rays in Medicine. by Francis H. Williams, and a case of Wandering Phlebitis, by W. P. Northrup, of New York, etc.

We congratulate the Association on the very high character of all the papers read before it. A. D. B.

Notes on the More Common Diseases of the Eye By Robt. W. Doyne, F.R.C.S. London: H. K. Lewis, 136 Gower Street, W.C. 1896.

Mr. Doyne's little Brochure on the more common diseases of the eye is very readable.

It is really a very condensed epitome of the contents of the larger works on this subject, and is intended for the general practitioner who may be too busy to consult these more extensive books.

The author evidently presupposes in many places that the reader has studied already the subject of ophthalmology, and if so, it is difficult to imagine the particular niche this present publication is to fill.

The descriptions, although of necessity very condensed, are yet well done. J. W. S.

The Tonic Treatment of Syphilis. By E. L. Keyes, A.M., M.D. Revised Edition. New York: D. Appleton & Co. 1896.

Dr. Keyes' name is well known to the profession as an authority on the treatment of venereal disease, a position to which his large and long experience as Professor of Syphilology in Bellevue Hospital Medical College entitles him. In the present small brochure of 80 pages he explains his method of administering mercury so that its action may prove tonic and not harmful. The details of the general and local treatment are given, with the special means which he employs to relieve special lesions. We can recommend the work to our readers. A. D. B.

Essentials of Physical Diagnosis of the Thorax. By Arthur M. Corwin, A.M., M.D., Demonstrator of Physical Diagnosis in Rush Medical College, etc., etc. Second Edition, revised and enlarged.

This book of 200 pages, contains a systematic arrangement of the subject in tabular form, taking up the landmarks, methods of physical diagnosis, and signs in the separate diseases, in order. G. G. C.

A Manual of Venereal Diseases. By James R. Hayden, M.D., Chief of the Venereal Clinic at the College of Physicians and Surgeons, New York. Professor of Genito-Urinary and Venereal Diseases in the Medical Department of the University of New York; Visiting Surgeon to the New York City Hospital. Lea Brothers & Co., New York and Philadelphia. 1896.

This work, though in a compact form, gives a clear and practical knowledge of the three venereal diseases, gonorrhœa, chancroid and syphilis. The lines of treatment suggested are conservative; only those well-known and well-tried methods are given place, and the many recent novelties are conspicuous by their absence. Those who have not the time nor the inclination to read the large works on this subject, will find this little volume a valuable and safe guide. K. C.

Literary Note.

Mr. W. B. Saunders announces the following books for early publication :

An American Text-Book of Genito-urinary and Skin Diseases. Edited by L. Bolton Bangs, M.D., and William A. Hardaway, M.D.

An American Text-Book of Diseases of the Eye, Ear, Nose, and Throat. Edited by G. E. de Schwenitz, M.D., and B. Alexander Randall, M.D.

Surgical Diagnosis and Treatment. By J. W. Macdonald, M.D.

A Text-Book of the Theory and Practice of Medicine. By James M. Anders, M.D., Ph.D., LL.D.

Tuberculosis of the Genito-Urinary Apparatus, Male and Female. By Nicholas Senn, M.D., Ph.D., LL.D.

A Text-Book of Gynæcology. By Charles B. Penrose, M.D.

A Text-Book of Obstetrics. By Barton Cooke Hirst, M.D.

A Manual of Orthopedic Surgery. By James E. Moore, M.D.

A Text-Book of Embryology. By John C. Hensler, M.D,

Pathological Technique. By Frank B. Mallory, A.M., M.D., and James H. Wright, A.M., M.D.

Diseases of Women. By J. Bland Sutton, F.R.C.S., and Arthur E. Giles, M.D., B.Sc.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

Stated Meeting, March 12th, 1897.

J. George Adami, M.D., First Vice-President in the Chair.

Discussion on Isolation and Disinfection of Scarlet Fever, Measles and Diphtheria.

Dr. G. Gordon Campbell exhibited a table which he had compiled showing the facts, so far established, concerning the period of incubation, duration of infection, date of appearance of the eruption, etc., in these three diseases.

Dr. E. P. Lachapelle discussed first the management of infected cases in the house. With regard to scarlet fever, isolation should last from the time of diagnosis for forty or fifty days and should be absolute the nurse chosen should be one who had previously had the disease. The patient, before leaving the room, should be thoroughly disinfected and dressed in clean clothes, and then the room also should be thoroughly disinfected before other members of the family were admitted.

Diphtheria, with ordinary precautions, was much more easily isolated, as air was not a medium of transmission of the infection. It was impossible to determine how long isolation was necessary ; it should be kept up as long as bacilli were found in the throat.

Of the three diseases, measles was much the most difficult to isolate at home, and as the contagion was well marked even before the diagnosis could be made, the whole family would already have become contaminated. The whole household must therefore be quarantined, and as the disease was not a long one, this was not a very great hardship. Though not usually fatal, statistics showed that measles in a large proportion of cases, left serious sequelæ, the physicians were not careful enough in making the family understand that strict isolation would do away with the periodical outbreaks at present experienced.

The question of transmission of these diseases by the attending physician was a very important one. He must remember that he was liable to convey the disease unless proper precautions were taken to prevent it. Dr. Lachapelle advised that the infectious cases should be seen last, and that the physician should have a wrapper or overall

in the passage near the door of the patient's room to wear while making his visit. This garment should be put aside and disinfected before the next visit. He should also disinfect his hands and face before leaving the house. These procedures would not only protect other families, but would serve to educate the public to the necessity of taking rigid precautions against infection, and the physician must also make them understand that they must give up all social engagements, shopping, etc., and that if the head of the family must attend to his work he must live elsewhere.

On making a diagnosis, the first duty of every physician was to report to the local Board of Health so that they could, in some measure, control the spread of the disease. The Board might also aid the doctor in the discharge of his duties by having a little pamphlet, instructing people in the methods of isolation, etc., which could be distributed by the officer whose duty it was to placard the house.

Dr. Wyatt Johnston stated that by order of the Provincial Board of Health he had recently been investigating the question of disinfection, especially by means of formaldehyde. In discussing the usual means of house disinfection after contagious disease, he pointed out the necessity of waiting until the inmates of the house were no longer a source of infection before disinfecting the premises. In the case of diphtheria, the throat should be free from the bacilli.

In disinfecting articles of clothing, bedding, etc., it was necessary to have a rapid and certain method which would not damage the goods. Steam under pressure answered these requirements well for most articles, the only precaution needed being that of warming the articles to about 180°F., and thus avoid condensation, before letting in the steam, as it was moisture from condensation and not that in the steam vapour itself which did mischief.

Expensive and fine goods, such as laces, silks and velvets stood steam disinfection better than the cheaply dyed fabrics belonging to the poor. The colours of the latter were liable to run.

With reference to sulphur gas, it appeared now to be generally admitted that this was only a surface disinfectant, and had not sufficient powers of penetration to disinfect bedding, clothing, carpets and hangings.

In the absence of better means of disinfection, sulphur could be used, but all that could be reasonably expected of it would be the destruction of germs on the bare walls and floors. There was some epidemiological evidence to prove that in the case of smallpox and yellow fever sulphur was more efficient than in other infectious diseases.

Sulphur gas to be efficient required the presence of moisture, and this was liable to injure delicate goods. Chlorine or hydrochloric acid gas were both powerful but very destructive germicides ; for disinfecting stables and outbuildings they were excellent.

A large number of things were injured by steam treatment, such as furs, leather, books and toys and upholstered furniture. These, for the same reason could not be thoroughly treated with antiseptic solutions. For these the use of formalin vapour was admirably suited, as it gave complete disinfection without any injury to the textures or colours. Prolonged contact with formalin solutions would, however, act on iron somewhat. Formaldehyde vapour also offered a good means of sterilising walls, hangings and curtains. A sufficient quantity of the gas could be disengaged in a room to thoroughly sterilise the exposed surfaces and even to secure a certain amount of penetration. For this later object, however, the disinfection in a closed chamber was more certain and economical, as it enabled more work to be done with less material.

The Health Board of the City of New York proposed issuing formaldehyde for treating certain goods. Formaldehyde was officially recognized as a disinfectant in the State of Maine.

Formaldehyde could be generated in the room by means of a lamp converting methyl alcohol quickly. In this case at least one quart of alcohol per 1000 cubic feet should be used and the lamp should be capable of converting at least one quart per hour.

A better means of evolving the vapour was by regenerating it from a solution, for example, of formalin by treating it under pressure and allowing it to escape under a pressure of about three atmospheres. The presence of calcium chloride in the solution apparently ensured the gas being given off in a more effective state. Equal parts of formalin and a 10 p.c. or even a 20 p.c. solution of calcium chloride in water formed a convenient formula. From this mixture the gas was generally supposed to be all disengaged before the water had evaporated.[1]

The proper amount to be used was not yet fully determined. The Board of Health of the Province of Quebec, as the result of a number of experiments, advised at least one pound of formalin per 1000 cubic feet, while double that amount would be of advantage when penetration of bedding and upholstery was considered necessary. These amounts were larger than those usually recommended, and the printed directions generally given by the vendors of special patented appliances for this were usually far below the safety limit.

[1] A statement which does not appear to be very satisfactorily proved.—W. J.

In disinfecting a room the doors and windows, as well as any other openings, are usually pasted up and the gas blown in through the key hole for a period of a half to two hours, according to the effect desired. The room was then left closed for two or three hours more. When opened the fumes of formalin could be instantly neutralised by ammonia vapour. The resulting *formamide* compound had no noticeable smell, but was liable later on to decompose and liberate formaldehyde afresh, hence repeated applications of ammonia might be necessary. By simply opening the windows and waiting a few hours this late evolution of formaldehyde could be avoided.

Formaldehyde vapour penetrates clothing and bedding much more slowly than steam, but it is very efficacious in the dry state.

The capacity of formaldehyde for killing spores is relatively high, whereas sulphur gas has practically no action upon spores.

Much of the apparatus sold for formaldehyde disinfection is very inefficient.[1]

Dr. A. D. BLACKADER pointed out the possibility in some cases of effectually isolating scarlet fever even after the disease had actually commenced. He cited the following case. In a family of two children, brother and sister, the boy while suffering from vomiting, sore throat and fever, was repeatedly kissed by the little girl who lay beside him on the sofa with her arms around his neck. The patient was seen by him thirteen hours later, at once isolated, and later on developed a moderately severe case of scarlet fever, and yet the little sister escaped. He had isolated scarlet fever as late as sixty hours after the appearance of the rash and in no case was there an outbreak in the family.

With regard to the length of time the infection lasted, he thought we were not able to speak in an absolute way, and that it depended upon the duration of desquamation, which in some cases it was possible to shorten so as to allow isolation to be completed at four weeks. The physician should also take into account the condition of the nose, throat, and ears in determining this point.

He thought that in children returned from hospital more or less isolation should be kept up for a few days, as Ashby's statistics showed that from two to four per cent. of returned cases communicated the disease.

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[1] A number of different models of formaldehyde apparatus, the property of the Board of Health of the Province of Quebec, were shown at the meeting. The officials of the Board are willing to furnish any information in their power as to the most efficient forms obtainable. Changes and improvements in the apparatus are so frequent and considerable, that it does not appear desirable to specify here which forms comply with the requirements mentioned above.

In measles, probably more could be done in the way of isolation than was generally supposed. The probability of the physician carrying disease from one house to another was not great where proper care was exercised, and he thought the plan suggested by Dr. Lachapelle, of having a coat for the physician's use while in the house a very desirable one.

Dr. Macphail considered the time had come for a revision of our views upon disinfection and isolation, just as the views upon antiseptics and quarantine had been revised, and that the present discussion tended in that direction. He believed that isolation should hold first place, combined with instant destruction of all the infected secretions and excretions of the patient, in the same definite way as is practised in the laboratory. If, he said, in cases of diphtheria and scarlet fever, the secretions from the air passages were received and burned, and if, in cases of intestinal infection, the discharges were properly sterilised at the time, it would be a far safer method than depending upon indiscriminate disinfection. From bacteriologic evidence he showed the difficulty in the way of effective household disinfection. It was quite impossible in ordinary cases to ensure even a reasonable degree of isolation; it should be made a public duty and a public charge.

Dr. D. F. Gurd thought that if the doctor would wear his overcoat buttoned up at infectious cases and take it off before entering the rooms of non-infectious ones the danger of carrying infection would be minimised. He always followed this practice and had never carried any disease to his own or anybody else's children. The linen duster mentioned by Dr. Lachapelle would be a source of increased danger, for if kept in the sick room it must surely put contagion on the doctor's clothes, and if brought and kept out of the room it would rightly frighten the well persons.

Dr. F. W. Campbell had understood Dr. Lachapelle to say that if these three diseases had been effectively isolated they would have been got rid of just as in the case of smallpox. He did not agree with him here, but considered that we were free from smallpox because of vaccination rather than isolation.

Dr. Wesley Mills thought that the principle of educating the public on the subject of isolation and disinfection, as advocated by Dr. Lachapelle, was the most powerful means of all of preventing the spread of these diseases.

Dr. J. G. Adami felt that it was the duty of the physician to ostentatiously educate the patients in these principles, and it would be ridiculous to demand precautions from others which we did not

observe ourselves. Among the poor the only way of entirely stamping out these diseases would be by compulsory isolation in a proper fever hospital.

Dr. LACHAPELLE, in replying to Dr. Campbell, said that he did not intend to classify these three diseases with smallpox, but, if isolation were properly carried out, they would be checked or reduced to a minimum. Though the real cause was unknown one case certainly followed another, and if the first case were isolated there would be no epidemic.

In replying to Dr. Gurd, he thought that visiting with one's overcoat on was not a safe practice.

Stated Meeting, March 26th, 1897.

GEORGE WILKINS, M.D., PRESIDENT IN THE CHAIR.

Lefort's Amputation of the Foot.

Dr. J. H. HOGLE reported for Dr. Armstrong the following case and exhibited the patient:—

C. I. F. was admitted to the wards of the Montreal General Hospital on February 20, 1897, suffering from severe laceration of the foot. The bones of the tarsus were fractured and displaced, leaving the foot hanging by the skin of the plantar surface. Immediate operation was advised, and Lefort's modification of Syme's operation was performed. An incision, commencing half an inch below the external malleolus, was made across the front of the ankle with a slight convexity downwards to the corresponding point half an inch behind the internal malleolus, and the ends connected by an incision transversely across the sole from point to point, slanting a little forward. The joint was then opened. The foot being depressed the lateral ligaments and the tendo Achillis were divided. The malleoli were removed, leaving the surface convex. The articular surface of the os calcis was then sawn through, leaving a concave surface. The posterior tibial artery was carefully avoided, the tendons were shortened, hœmorrhage checked, the bony surfaces brought together and wired with silver wire (No. 4), and the flaps sutured with silk-worm gut. Drainage was left at the most dependant part for forty-eight hours. Union took place by first intention, and the patient was able to stand on the stump of the foot four weeks after the operation.

Compound Depressed Fracture of the Skull.

Dr. J. H. HOGLE exhibited the case for Dr. Armstrong, and read the following report:—

J. H., male, æt. 50, was admitted to the Montreal General Hospital with

a compound depressed fracture of the skull. Over the squamous portion of the temporal bone there was a large hæmatoma with a punctured wound in the centre admitting a large probe. Fracture of the skull was made out just above the auricle. The patient was in a semi-conscious condition, with pupils dilated, acting sluggishly to light, but there were no changes in the fundus. He remained in the same condition for two days when operation was advised. The incision was enlarged for two inches, the tissues were reflected and the fracture exposed. The thin squamous portion of the temporal bone had been fractured in a number of pieces with fissures running into the sphenoid. The pieces of bone were depressed, making a considerable indentation in the membranes. The blood clot was all turned out, twelve pieces of bone removed and placed in a warm carbolic solution. Considerable hæmorrhage followed, but was checked. Six pieces of bone were replaced over the membranes and the incision brought together, with drainage for forty-eight hours. Union resulted by first intention. The patient was discharged in three weeks in good condition, and on return three weeks later he showed no signs of necrosis of bone.

Suffocation and Intussusception.

Dr. ANDREW MACPHAIL showed the specimens, a trachea and œsophagus occluded with a piece of meat, and an intestine obstructed by the process of intussusception. In the former case the piece of meat was impacted in the upper part of the gullet, and a small projection from the side was inserted beneath the epiglottis into the windpipe. The intestine was obstructed for the space of six inches, the bowel intensely congested, but no appearance of lymph or gross signs of peritonitis. The patient was picked up on the street and died, it was thought, from chloral poisoning so marked was the intestinal lesion.

Dr. WYATT JOHNSTON thought the condition of suffocation was more common than was generally supposed, and that many cases were mistaken for sudden syncopal attacks. In sudden obstruction of the larynx a person might fall dead without a symptom. Statistics of autopsies of sudden death showed six per cent. due to this particular cause. An instance was recorded where a man falling off a load of grain got a grain of wheat in his larynx and died of suffocation.

The PRESIDENT referred to a case reported in Taylor's Legal Medicine in which a sudden death occurred after a brawl and the cause of death given at the autopsy was congestion of the brain. Further investigation proved it to be due to suffocation from a small piece of meat in the larynx.

Plague Bacilli.

Dr. J. G. Adami gave a demonstration of the plague bacilli, and showed a rat killed by the disease and exhibiting the characteristic glandular enlargements.

Doctors and Law.

Mr. Peers Davidson, of the Montreal Bar, read this paper. (See May and June Journals.)

Stated Meeting, April 9th, 1897.

J. George Adami, M.D., First Vice-President, in the Chair.

Apparent Primary Cancer of the Inguinal Glands.

Dr. A. E. Garrow reported this case. (Will be published later.)

Dr. F. J. Shepherd asked how Dr. Garrow explained the enlargement of the corresponding glands on the opposite side seeing that there was no connection through the lymphatics.

Dr. J. G. Adami drew attention to the fact that it was not unusual to find in mammary cancer both glands affected. The explanation might be that there were two primary foci.

Dr. J. C. Webster stated that the so called primary cancer of the inguinal glands in women was sometimes secondary to cancer of the cervix or side of the bladder, the connection between the inguinal and hypogastric glands being through the glands of Guerin. He, therefore, asked if a careful examination of the inside of the pelvis had been made.

Dr. A. E. Garrow in replying, stated that a careful examination of the pelvis had revealed nothing more than an enlarged prostate. On his patient's first visit Dr. Garrow had detected an indurated mass on the dorsum of the penis but a tight foreskin had prevented examination and he had since refused operation.

Perforated Gastric Ulcer.

Dr. R. C. Kirkpatrick exhibited a patient and gave the following account of the case :—

The patient whom you see before you was taken suddenly ill on the morning of March 3rd. She complained of intense pain in the upper part of the abdomen. She had previously been in good health with the exception of a slight amount of indigestion. On this morning she had gone to her work as usual and about eleven o'clock was suddenly seized with intense pain in the region of the stomach. She became very faint but did not lose consciousness. She was conveyed to her home, where I saw her shortly after one o'clock. At that time she was pale, with a rapid pulse and sub-normal temperature. On

examination the whole abdomen was tender but the point of maximum tenderness was in the epigastric region. She was removed to the Montreal General Hospital and at three o'clock, four hours after the onset of the attack, the abdomen was opened. Stomach contents escaped as soon as the peritoneum was cut through and a short search discovered a perforation in the anterior wall of the stomach, four inches from the cardiac orifice and near the lesser curvature. The opening was about the size of a bean. The edges were drawn together by a row of continuous sutures and then inverted by a double row of Lembert sutures. The peritoneum in the vicinity was cleansed by sponging, no irrigation being used. A rubber drain was inserted and the abdomen closed. A glass drainage tube was inserted into the pelvis through a small opening made just above the pubes, and from this latter opening fully a pint of turbid serous fluid escaped. The upper tube was removed in twenty-four hours and the lower tube in forty-eight. In twelve hours, small quantities of hot water were given by the mouth, and in twenty-four hours milk and lime water was given. The patient made an uninterrupted recovery.

The diagnosis was based on the suddenness of the onset, the signs of peritoneal irritation with the point of maximum tenderness over the region of the stomach, and the previous history, indefinite though it was, of derangement of the stomach. Such a combination of symptoms point very strongly to a perforated gastric ulcer.

Dr. Jas. Bell emphasised the fact that in early operations success was almost certain, but if a number of hours was allowed to elapse one would be almost sure of failure.

Epithelioma of the Floor of the Mouth.

Dr. Jas. Bell exhibited this patient. (Will be published later.)

Brains of Four Epileptics.

Dr. J. A. Macphail exhibited the brains of four epileptics, in course of preparation by Jones' method, which were not yet examined in sections. They formed part of a series of ten epileptic brains, prepared for examination in various ways. The gross appearance of the brains varied greatly, depending upon such associated or causative conditions as those arising from alcoholism or connective tissue changes. It was mentioned that the brains examined showed a uniform appearance, namely, a fatty degeneration and a vacuolation of the nuclei, when stained with aniline blue black. He thought the statement would have to be altered that "the changes in the nerve centres in epilepsy elude the most minute research."

Resection of Gangrenous Intestine.

Dr. Jas. Bell showed a section of intestine removed for gangrene and exhibiting some unusual features.

Three Cases of High Operation for Cancer of the Rectum.

Dr. Jas. Bell read a paper on this subject. (See page 929 of the June Journal.)

Dr. F. J. Shepherd agreed with Dr. Bell that the sacral was the only proper method. He thought preliminary colotomy was a very important point in the treatment, as it was possible by this means to keep the bowel clean. He felt that an uncontrollable anus low down was not as valuable as a controllable one higher up.

Dr. G. E. Armstrong felt that the sacral incision could be made safely and successfully when inguinal cotomony previously performed ensured asepsis. Heinecke's incision allowed of the greatest degree of access to the pelvis and the whole of the rectum, thus hæmorrhage could be controlled and the operation performed with a minimum loss of blood. He referred to a man shown before the Society a year ago, upon whom he had practiced the high operation, and who was still well and defecating through his colotomy wound.

Early diagnosis was a most important point, and he felt that every man getting up in years, anæmic, loosing weight and complaining of diarrhœa, should have his rectum examined.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI. JULY, 1897. NO. 1.

BRITISH MEDICAL ASSOCIATION.

MONTREAL MEETING.

The time of the great medical event of the year at Montreal is not now very distant, and it behooves all who may not have decided to be present at the meeting to speedily make up their minds, and if the visit is contemplated, to at once inform the Committee at Montreal of the fact. We learn that they are very anxious to know approximately how many they will have to entertain, and urgently request all who intend going to at once inform the local Secretary, Dr. J. A. Springle, 2204 St. Catherine street, of the fact. The probable attendance of medical men is estimated at the present time to be about one thousand: two hundred and fifty from England, fifty from other Colonies, three hundred from the United States, and four hundred Canadians. Three or four lady members have signified their intention of coming across the Atlantic, among them Mrs. Garrett Anderson. Dr. Saundby, Dr. Barnes and Mr. Fowke will arrive in Montreal on the 14th August by the Parisian.

Dr. Adami writes that the names of members who intend coming across are coming in daily, but when he wrote was not certain that a special steamer would be required, but he is prepared at any moment to charter a vessel in the event of a sufficient number of late applicants appearing.

Several eminent men who cannot be present at the meeting have promised to send demonstration specimens. The English secretaries are generally working in this direction.

Among the interesting discussions which are being arranged for is one on syphilis, between the dermatological and pharmacological sections, introduced by Dr. Whitla, of Belfast, Ireland, members of other sections being of course invited to attend.

Full arrangements will be made in advance whereby members intending to land at Quebec may obtain cards of membership entitling them to half fare and the privileges granted by the Customs Department. The vessels conveying members will be met by Canadian representatives, probably at Rimouski.

One of the most interesting and pleasant of the numerous excursions will be the one arranged for to Ottawa, probably on Saturday. Dr. Roddick met the profession in Ottawa some days ago, and subsequently the Finance Committee of the City Council, who promised to undertake all the expenses connected with the giving of a luncheon to the visiting members of the Association.

During Dr. Roddick's recent visit to Toronto he spent some time with Professor McCallum, Secretary of the B.A.A.S., from whom much information was obtained regarding the arrangements for that meeting. He found that a great many purposed attending both meetings, more especially those belonging to the physiological section. Dr. Roddick arranged with the President of the branch, Dr. I. H. Cameron, to have any members of the B. M. A. entertained during their stay in Toronto. He found the profession as a whole very enthusiastic regarding the meeting, and very anxious to assist their Montreal brethren in every way.

It was Dr. Roddick's intention to have formed other branches in Western Ontario, in such places as London and Hamilton ; but there was a feeling on the part of the profession in these places that there was not room for branches which might interfere with the existing local medical societies.

Rev. Dr. Norton has kindly offered the Association the English Cathedral for a special service, and Dr. Adami has arranged with Bishop Dumoulin who is now attending the Lambeth Conference, to officiate.

Some six hundred invitations have already been sent out to American physicians and specialists and replies have been received from two hundred and twenty-one. Among those who have intimated their intention of attending the meeting are: A. C. Abbott, Department of Hygiene, University of Pennsylvania; John Ashhurst, Jr., L. D. Bulkley, W. T. Bull, H. T. Byford, H. P. Bourditch, J. Solis Cohen, T. M. Cheeseman, D. W. Cheever, W. B. Coley, J. McKeen Cattell, Fred S. Dennis, D. B. Delavan, Reginald Fitz, Geo. H. Fox, Frank P. Foster, Christian Fenger, Virgil Gibney, H. G. Garrigues, E. H. Grandin, Landon Carter Gray Geo. M. Gould, Hobart A. Hare, C. A. Herter, James Nevin Hyde, E. Hodenpyl, B. C. Hirst, A. Jacobi, Chas. Jewitt, M. McKeen, Howard A. Kelly, C. A. Lindsley, John H

Musser, W. F. Mittendorf, Hunter McGuire, Thos. G. Morton, H. H. Mudd, J. B. Murphy, Paul F. Munde, W. P. Northrup, Wm. Pepper, Roswell Parke, Fred C. Shattuck, Louis Starr, W. Allen Starr, J. N. Shoemaker, E. C. Sitzka, Geo. F. Shrady, E. L. Trudeau, James Tyson, Hiram N. Vineberg, Wm. H. Welch, Casey Wood.

The English list of members coming has already appeared in the *British Medical Journal* and in the daily papers, but it will be of continued interest to know that those coming will have the privilege of listening to such men as Richet, of Paris; Prof. Charles B. Ball, William Mitchell Banks, Henry Barnes, Prof. R. Boyce, Watson Cheyne, Sidney Coupland, J. Ward Cousins, J. H. Crocker, Prof. E. M. Crookshank, Christopher Heath, Arthur Kelsey, D. J. Leech, Right Hon. Lord Lister, Harvey Littlejohn, Donald MacAlister, Stephen Mackenzie, Thomas M. Madden, Malcolm Morris, E. Nettleship, Robert Saundby, W. J. Sinclair, Prof. W. Whitla.

Replies have been received from twelve of the branches of the British Medical Association accepting the invitations tendered requesting them to send delegates.

The Museum Committee report that all their space has been taken up, and they probably will have to secure another building besides the large Victoria Skating Rink. This department will prove one of the most interesting features of the meeting. A rare opportunity will be afforded to see pharmaceutical preparations, surgical and medical appliances, and everything that interests the physician, from the leading firms of America and Canada, as well as from across the Atlantic. Among the leading surgical instrument manufacturers will be Collin, of Paris, and Down Brothers, of London, the latter making a special exhibition of antiseptic hospital furniture, which will be worthy of inspection. Among the leading pharmaceutical houses who are making elaborate displays will be R. K. Mulford, & Co., of St. Louis; Parke, Davis & Co., Detroit; Wyeth, of Philadelphia; Sharpe & Dohme, of Baltimore, and others. Zeiss is making a special display of microscopical apparatus. There will be also a great variety of exhibits from leading firms in Vienna, Berlin, Edinburgh, London, Paris and New York.

The local Entertainment Committee are being assisted by a committee of ladies, consisting of the wives of the members of the profession in Montreal and others. Among the entertainments provided for, in addition to those mentioned before, are numerous afternoon teas and garden parties. The Ladies' Committee will specially interest themselves in looking after lady visitors, and will make ample provision for continuously entertaining them during the progress of the

meeting, so that members may without hesitation bring their ladies with them, and be asssured that, while they themselves are fully occupied with the essential features of the meeting, the former will be so well looked after that the time will not hang heavily. The annual dinner will be held at the Windsor Hotel. The large dining room will accommodate six hundred. The dinner will cost members five dollars, including wines.

The Excursion Committee has arranged a varied and attractive programme which cannot fail to meet the desires of all. We have already mentioned some of the excursions which have been arranged.

Among other excursions not noted before is the one on Lake Memphramagog to Newport and Magog. This is one of the most picturesque spots in the Province of Quebec, and the trip will carry the tourist through one of the most fertile portions of Canada, with scenery of mountain, lake and river, fairly typical of what is characteristic of most of the Province, and to be seen more especially in almost endless variety in the Laurentian district, which for want of time cannot be visited. A special train will be provided which will enable the party to return in the evening. The steamer will accommodate about eight hundred. Lunch will be taken at Newport, or probably at the foot of Owl's Head, if it is found that the hotel there can supply refreshments for the number expected to go. The excursion will be arranged for Saturday, and it is thought probable that for those desiring it the privilege of remaining over Sunday and returning on Monday will be obtained.

A trip is proposed to Shawenagan Falls, on the St. Maurice River which are said to almost rival Niagara.

Among other local trips on different afternoons are a ride around the Mountain on the electric cars and through some of the more interesting parts of the city; a trip to the top of Mount Royal, where a luncheon will be served by the Mayor and Corporation of Montreal. The incline railway, carriages or bicycles may be the means of arriving there; a steamboat trip down the St. Lawrence; another to Ste. Anne and down the Lachine Rapids. It can be gained from what we have indicated that those going to the Montreal meeting will not only be benefited from a medical point of view by coming in contact with the leading members of the profession from Britain, the United States and Canada, and taking in the various discussions and papers which may be expected to represent the most recent advances, but that they will also be fully repaid by a varied and full round of social enter-

tainments and pleasure trips, such as has not been privileged to the members of any previous meeting.

The first Colonial Meeting of the British Medical Association which is to be held in Montreal, August 31st, and September 1st, 2nd and 3rd, is now an assured success. The latest news from England is that members are deciding to come in daily increasing numbers, and already papers from the leaders in the great educational centres of Great Britain, Europe and the United States are promised in large numbers.

We hope that the members of our profession in Canada are alive to the great importance and interest which attaches to this coming meeting. It is not at all probable that again during the life time of our readers will such another opportunity occur of meeting so many men whose names have been familiar to us since our student days as authorities upon the various departments of medicine and surgery and public health. Representatives from Australia, India, Hong Kong, France and the West Indies have signified their intention of being present. The advance in medical knowledge and the treatment of disease from such a congress of medical men from different clinics can hardly be overestimated. No wonder Russia is envious of the Montreal meeting.

The members of the medical profession suffer from over-work, anxiety and isolation. Now comes an opportunity to break loose and have a holiday, a rest; an opportunity of meeting congenial spirits, and of getting the cobwebs brushed away. The papers and discussions will be of a high order and practical character. It has long been noticed that the doctor who takes an occasional holiday, who meets his confrères in medical congresses advances beyond the stay-at-home, who never goes away for fear of losing a patient. The coming meeting of the British Medical Association will have attractions greater than the ordinary, and no practitioner in Canada can afford to stay away.

Although the meeting will be a very large one, probably two or three thousand medical men being present, no one need fear being unable to secure accommodation, and at not more than ordinary rates. The reception is an active committee, and is in a position to promise that all who come will be welcome and will be able to secure comfortable quarters.

Very exceptional privileges have been granted to members of the British Medical Association and their wives in the unusually low

rates quoted by all the Canadian railroads. Any member of the Association can come to Montreal for half of one single first-class fare or can buy a return ticket for one single first-class fare. Those members who have no certificate of membership on starting can pay one single fare coming to the meeting and secure a pass back to starting point free. The same rates and privileges are granted to members wives and children. These rates are unusually low. They apply of course to Canadian roads only.

We would strongly urge as many as possible to take advantage of these very low rates, not only by coming to the meeting but by improving the opportunity thus afforded of seeing something of Canada. No one can appreciate Canada, its enormous wheat growing area, mineral resources and unrivalled scenery, until they have travelled across the continent to the Pacific coast. By the payment of an extra five dollars members can return from the coast by the Northern Pacific and disembark at Livingstone and visit the Yellow-Stone Park. The trip through the Park is, of course extra.

A still further attraction is that the Canadian Pacific Railway will grant to all members going across the continent free passes over all their branch lines of railway in Manitoba and the North-West Territories and over all their steamboat lines in the Canadian North-West.

These rates are good from the 1st July to the 30th September.

The extent of territory, fertility of soil, mineral deposits and beauties of landscape seen on this trip will prove a revelation to all those going for the first time. The trip is not a tedious but a thoroughly enjoyable one and a more favourable opportunity of going may never occur.

It is a good thing to know something of one's own country and such a trip as this will develop loyalty and confidence in Canada's future.

PRELIMINARY PROGRAMME.

A. Medicine.

Macdonald Chemical Building.

The following discussions will probably take place :

1. The Dietetic Treatment of Diabetes, to be opened by Dr. Robert Saundby, and will be continued by Dr. Osler and Dr. Sidney Coupland.

2. Arthritis Deformans (Rheumatoid Arthritis), more especially its Relation to Rheumatism, Nervous Disease, and Tuberculosis. This discussion will probably be opened by Professor J. Stewart (McGill University).

3. On Gall Stones, with reference particularly to Biliary Colic, Cholangitis, and Hepatic Intermittent Fever without Icterus. Dr. Graham, Dr. Osler, Dr. Handford, Nottingham, Dr. Sidney Coupland, London, and Dr. Wm. Hunter, London, intend to take part in this debate.

The following, among others, are expected to take part in the discussions in this Section: Dr. Reginald Fitz, Boston; Dr. Jacobi, New York; Dr. Musser, Philadelphia; Dr. Pepper, Philadelphia; Dr. F. C. Shattuck, Boston; Dr. E. L. Trudeau, Saranac Lake, N.Y.; Dr. Jas. Tyson, Philadelphia; Dr. Wyman, Marine Hospital Service, Washington.

B. Surgery.

Large Lecture Room, McGill Medical College.

The President will give a short introductory address.

A discussion will take place upon the Surgical Treatment of Appendicitis, which will be opened by Dr. G. E. Armstrong, Montreal; and Dr. J. Ward Cousins, Southsea.

A discussion will take place upon the Treatment of Cancer of the Rectum with special reference to the high operation, opened by Dr. James Bell, Montreal.

Among those who, it is anticipated, will take part in the discussions in this Section are: Dr. W. W. Keen, Philadelphia; Dr. John Ashurst, Philadelphia; Dr. Cheever, Boston; Dr. Dennis, New York; Dr. Murphy, Chicago; Dr. McGraw, Detroit; Dr. J. W. White, Philadelphia; Dr. Chas. T. Bull, New York.

The following gentlemen have given notice of their intention to read papers in this Section:

James F. W. Ross, M.D., Toronto: Some Rare Conditions of the Kidney. H. O. Marcy, M.D., Boston: On the Suturing of Wounds. Theo. A. McGraw, M.D., Detroit: Invagination of the Cæcum and Vermiform Appendix. F. J. Shepherd, M.D., Montreal: A Case of Abdominal Tumour, in which nearly eight feet of the Small Intestine were Resected. A. B. Atherton, Fredericton: Report of a Case of Strangulation of a Loop of Ileum with an Attached Meckel's Diverticulum through a hole in the Mesentery.

C. Public Medicine.

Large Lecture Room of the Redpath Museum.

The President will give an address on the Sanitary movement in Canada.

The subjects more particularly proposed for discussion are:

1. How Far should Mandatory Measures go in Dealing with (*a*) Measles, (*b*) Whooping Cough, (*c*) Tuberculosis, (*d*) Leprosy. To be introduced by Dr. P. H. Bryce, Toronto.

2. As to the Utility of Quarantine as now Conducted (Inspection, Disinfection, and Isolation Stations) in Certain Countries at Least. To be opened by Dr. F. Montizambert, Grosse Ile, Quebec.

3. The Control of Venereal Disease by Restrictive Legislation.

Among those who have expressed their intention to take part in the work of the Section and to read papers are:

G. Janin, Montreal: The Conditions Necessary to the Success of Sewage Farming. J. R. Kaye, (M. O. H. to the Council of the West Riding of the County of Yorkshire); The Relationship of the Health Officer to the Registration and Certification of Deaths. Wyatt Johnston, M.D., Montreal; Experiments with Disinfectant Gases. A Newsholme, M.D., (M. O. H. Brighton); A Plea for the International Study of Diphtheria, Illustrated by Facts and Figures.

D. Obstetrics and Gynæcology.

Large Lecture Room, McDonald Physics Building.

The following discussions will, it is proposed, be held in this Section on the days indicated:

September 1st.—The Causation and Treatment of Hyperemesis Gravidarum.

September 2nd.—The Vaginal *versus* the Abdominal Route in dealing with Inflammatory Conditions and Tumours in the Pelvis.

September 3rd.—The Palliative and Radical Treatment of Uterine Flexions and Displacements.

The following papers are promised:

T. More Madden, M.D., F.R.C.S.I., Dublin: 1. On some Points in the Modern Treatment of Tedious Labour with description of a new Traction Forceps. 2. On the Conservative Treatment of Fallopian Tube Disease. John Campbell, M.D., F.R.C.S.I., Belfast: Labour Complicated by Abnormalities of the Cervix Uteri and Vagina.

Among those who are expected to take part in the work of this Section are: Professor A. W. Mayo Robson, Leeds; Mr. Lawson Tait, Birmingham; Dr. T. W. Eden, London; Dr. Inglis Parsons, London; W. H. A. Kelly, Baltimore; Dr. P. F. Munde, New York; and W. R. Goffe, New York.

E. Pharmacology and Therapeutics.

Lecture Hall of the Wesleyan College.

It is intended that discussions shall be held upon the following subjects:

1. The Treatment of Insomnia, embracing (*a*) general treatment; (*b*) the value of individual drugs, especially the newer hypnotics; (*c*) their ill effects and the contraindications to their use; (*d*) their mode of action. This discussion will be opened by Dr. Clarke, of the Rookwood Asylum, Kingston.

2. On Diuretics, including (*a*) their pharmacological action, and (*b*) their therapeutic uses.

3. On the Treatment of Syphilis, to be introduced by Dr. Whitla, Belfast.

Among the papers those who intend to take part in the proceedings of the Section are: Dr. A. R. Cushny, University of Michigan, Ann Arbor; Dr. A. D. Blackader, Montreal; and Dr. H. A. Hare, Philadelphia; who will read a paper on The Importance of Studying the Absorption and Elimination of Drugs.

F. Pathology and Bacteriology.

Lecture Room II, McGill Medical College.

The following will be the subjects for discussion:

1. Serum Diagnosis and the Agglutinating Action of Serums, to be introduced by Professor Wyatt Johnston, Montreal.

2. Immunisation.

3. The bubonic plague.

Papers have been offered by Dr. Sydney Copeman, London, on Vaccine; Dr. Herter, New York; Dr. C. F. Martin, Montreal; Dr. Hamilton Wright, Montreal; Dr. Adami and several others.

Among those who will take part in the discussions will be Professor Welch, Johns Hopkins; Professor Crookshank, London; Dr. W. Hunter, London; Dr. A. C. Abbott, Philadelphia; Dr. T. M. Cheesman, New York; Dr. R. Fitz, Boston; Dr. E. Hodenpyl, New York; Dr. Trudeau, Saranac; and Dr. F. F. Wesbrook, Minneapolis.

It is urged that British pathologists unable to be present should send to Dr. Rupert Boyce lantern slides and other material for demonstration bearing upon the subjects selected for discussion.

G. Psychology.

Morris Hall, Presbyterian College.

The officers of this Section, believing that many of the papers already offered will be provocative of considerable debate, have determined to announce no special subjects for discussion. Among those who have offered to contribute papers are: R. M. Bucke, M.D., London, Ontario, Asylum; On Mental Evolution. W. Clarke, M.D., Toronto Asylum; The Reflexes in Psychiatry. —. Hobbs, M.D., London, Ontario, Asylum; Surgical Gynæcology in Insanity. J. Russell, M.D., Hamilton, Ontario, Asylum; Insanity in its Relation to the State. George Villeneuve, M.D., Longue Pointe; Crime and Insanity.

Among those who intend to take part in the business of the Section are: Dr. N. H. Beemer, Mimico Asylum, Ontario; Dr. G. Alder Blumer, Utica, New York; Dr. C. K. Clarke, Rockwood Hospital, Kingston, Ontario; Dr. Edward Cowles, Waverley Mass.; Dr. T. D. Crowthers, Hartford, Conn.; Dr. G. Stanley Hall, Worcester, Mass.; Dr. Hazlitt, Sunbury; Dr. Henry Hurd, Baltimore; Dr. Rogers, Asylum for the Feeble Minded, Faribault, Minn.; Dr. George H. Rohe, Maryland Hospital for the Insane, Catonsville; and Dr. Rothesay Stewart, Leicester.

H. Ophthalmology.

Lecture Room I, McDonald Engineering Building

It is intended that a discussion should take place on the Prevention of Accidents to the Eyes of Persons engaged in Industrial Employments. The following gentlemen have expressed their intention of contributing papers to the Section: Charles G. Lee, Liverpool; On an Unusual Case of Orbital Tumour. T. H. Bickerton, Liverpool; 1. The Question of Colour Vision in the Public Services; 2. On Mules's Operation.

Specimens.—Specimens will be shown by Mr. Treacher Collins and Mr. Priestly Smith.

I. Laryngology and Otology.

Lecture Room II, McDonald Engineering Building.

The following papers are announced in this Section:

J. H. Bryan, Washington; A Contribution to the Anatomy of the Fronto-Ethmoidal and Frontal Maxillary Regions. Arthur G. Hobbs. M.D., Atlanta, Ga.; When not to Inflate the Middle Ear. Jobson

Horne, M.D., and Yearsley McLeod, F.R.C.S. 1. On Eucaine as a Local Anæsthetic in the Surgery of the Throat, Nose and Ear. 2. On Turbinectomy. Fletcher E. Ingals, M.D., Glasgow: On the Relation of Nasal Diseases to Pulmonary Tuberculosis. Chas. H. Knight, M.D., New York: Upon a Foreign Body (Metallic Button Hook) removed from the Larynx by Laryngo-Fissure. J. O'Dwyer, M.D., New York: Acute Syphilitic Stenosis of the Larynx in the Adult treated by Intubation. John O. Roe, M.D., Rochester, New York: The Correction of Nasal Deformities by Subcutaneous Operation. Scanes Spicer, M.D., London: 1. On Reduction of the Inferior Turbinate Bone in Certain Cases of Nasal Obstruction. 2. On the Significance and Treatment of Recurrent Retention of Secretion in the Lacunæ of the Tonsils. 3. A Case of Multiple Papillomata of Larynx in a Man aged 73.

Among those who intend to take part in the business of the Section are also Dr. J. Solis-Cohen, Philadelphia; Dr. Birkett, Montreal; Dr. Chretien, Montreal; Dr. G. R. McDonagh, Toronto; Dr. D. B. Delavan, New York; and Dr. J. W. Mackenzie, Baltimore.

J. Anatomy and Physiology.

Lecture Room I, McGill Medical College.

The following have been selected as subjects for the discussions:

September 1st.—Anæsthetics, to be introduced by the President of the Section, Dr. A. Walker. Among those who are expected to take part in this discussion are Dr. Shore, Cambridge; and Dr. Kemp, Baltimore.

September 2nd.—The best methods of Teaching Anatomy, to be introduced by Professor Alex. Macalister, Cambridge; and Dr. F. J. Shepherd, Montreal.

September 3rd.—The Causation of the Heart Beat and its Modifications, introduced by Dr. Gaskell, Cambridge; and Professor T. Wesley Mills, Montreal; Dr. Porter, Boston; Dr. Howell, Baltimore; and Dr. Bowditch, Boston; are expected to take part in the discussions.

The following papers have been promised:

Professor Alex. Macalister, Cambridge: The Influence of Head-Shape on Cranio-cerebral Topography. Professor W. H. Thompson, Belfast: Degenerations resulting from Lesions of the Sensory Area of the Cortex Cerebri.

Dr. Gustav Mann will send for exhibition specimens illustrating the Minute Histology of the Liver in Active and Resting Conditions. Dr. D. A. Welsh, Edinburgh, will exhibit specimens illustrating the His-

tology of the Parathyroid Glands. Dr. Geo. Oliver will exhibit his new Hæmoglobinometer and Hæmocytometer.

K. Dermatology and Orthopædics.

Lecture Room III, McDonald Engineering Building.

A subject selected for discussion in this Section is the Clinical and Pathological Characteristics of Vesicular Skin Diseases, especially the Dermatitis Herpetiformis Group.

It is intended that a joint meeting should be held with the Section of Pharmacology and Therapeutics for the discussion of the subject of the Treatment of Syphilis.

The following papers are announced:

James Galloway, London: On Melanotic Conditions of the Skin preceding Malignant Disease of the Skin. T. Colcott Fox: Demonstration of the Biology of the Trichophyte. R, Tait McKenzie, Montreal: The Accurate Measurement of Spinal Curvatures, with the description of a new instrument for the same.

Among those who are expected to take part in the discussions of this Section are Dr. E. B. Bronson, New York; Dr. L. D. Bulkley, New York; Dr. J. A. Fordyce, New York; Dr. J. N. Hyde, Chicago; Dr. G. T. Jackson, New York; Dr. Stephen Mackenzie, London; Dr. A. Eddows, London; and Dr. White, Boston.

ANNUAL MUSEUM.

The Pathological Museum.

The Pathological Museum will be established in the Dissecting Room of McGill Medical College, a large, lofty, and well-lighted room. The Secretary of the Pathological Sub-committee of the Museum Committee is Dr. C. F. Martin, McGill Medical College, Montreal, who will be glad to receive the loan of specimens, drawings, and photographs illustrative of both normal and morbid anatomy, as also any new apparatus for research in physiology, pathology, or bacteriology.

Specimens illustrating diseases peculiar to the remoter portions of the Empire are especially desired. It is proposed to make a special collection of photographs and micro-photographs of morbid conditions. These will be suitably mounted and carefully returned to the owners.

Suitable vessels and jars, and spirit and other media will be provided for moist specimens.

Foods, Drugs and Appliances.

1. Communications on general matters connected with the Museum and applications from intending exhibitors should be addressed to the Honorary Secretary, Dr. J. M. Jack, 2204 St. Catherine Street, British Medical Association Rooms.

2. Applications for space must be in the hands of the Secretaries before July 25th, accompanied with a brief descriptive account of each exhibit for insertion in the Museum Catalogue. Information of the allotment of space will be furnished as promptly as possible, and on receipt of cheque for the cost of such space, a card for the admission of the exhibit will be forwarded.

CANADIAN MEDICAL ASSOCIATION.

The annual meeting will be held in Montreal on August 30th, next. It is proposed to adjourn on the Tuesday morning in order that members may attend the sessions of the British Medical Association, and consequently most of the programme will, of necessity, be presented before the various sections of the latter association. It is proposed to open the meeting by a clinical demonstration at one of the hospitals, and at three o'clock the general session will begin. A short session will be held the next morning, Tuesday, to receive the report of the committees, after which the meeting will adjourn in time for the members to attend the opening exercises of the British Medical Association. It is hoped that on this occasion there will be a large turn out of the members. It is expected that when the committee on inter-provincial registration meet, material progress will be made towards the settlement of this vexed question.

MONTREAL GENERAL HOSPITAL.

Jubilee Nurses' Home.

For some time the question of better accommodation for the nurses has been engaging the attention of the Committee of Management of the Montreal General Hospital. At the last quarterly meeting, the Governors empowered the Committee to proceed at once with the construction of a building for a Home for their accommodation. In accordance with this, ground has already been broken for the foundation of this building, which is to be situated on the hospital grounds at the corner of Laugauchetiere and Cadieux streets. This step has been necessitated by the want of space in the quarters at present allotted to the nurses. With the advent of the training school and of modern methods of nursing, the number of nurses has been

increased without any corresponding increase in their residential accommodation, and as a result the Committee felt that the nurses were not as comfortable as they should be.

But this is only part of the scheme which the fertile brain of the President has evolved. Not content with labouring incessantly to reconstruct and modernise the Hospital building and equipment, labours in which he has been ably seconded by the members of the Committee and the citizens of Montreal, he desires to extend the sphere of usefulness of the Hospital itself by bringing the advantages of trained nursing within the reach of all. The idea, which was first publicly announced at the quarterly meeting, is, that the Hospital shall retain the services of one or more graduate nurses who will reside in the Jubilee Nurses' Home and be paid a definite salary by the Hospital. These nurses shall spend their time in visiting sick persons who require their services. In this manner, one nurse can attend to a number of patients. For these services the patients will pay a sum to be arranged by the Hospital authorities for each case. It has been proposed that the guarantee fund for the salaries should be raised by the churches, and that in return they should have the right of recommending patients. It is expected, however, that the scheme will be largely self supporting.

As a proof of how the idea of a Jubilee Nurses' Home has been received, we need only say that at the time of writing fully two-thirds of the amount required for its erection has been subscribed.

Mississippi Valley Medical Association.—The next meeting of the Mississippi Valley Medical Association will be held in Louisville on Oct. 5, 6, 7 and 8, 1897.

All railroads will offer reduced rates.

The President, Dr. Thos. Hunt Stucky, and the Chairman of the Committee of Arrangements, Dr. H. Horace Grant, promise that the meeting will be the most successful in the history of the Association, and this promise is warranted by the well-known hospitality of Louisville and Kentucky doctors.

Titles of papers should be sent to the Secretary,

Dr. H. W. Loeb,
3559 Olive Street, St. Louis.

NEW BOOKS, &c., RECEIVED AND NOTED.

Aphasia and the Cerebral Speech Mechanism. By William Elder, M.D., F.R.C.P., Ed. H. K. Lewis, London. 1897.

The Dispensaries of New York City ; their Use and Abuse. By Walter Brooks Brouner, A.B., M.D. Reprint from Medical Record, March 6th, 1897.

A New Operation for Extroversion of the Bladder. By Reginald Harrison, F.R.C.S. Reprint from Medical Press and Circular, April 28th, 1897.

Strophanthus : A Clinical Study. By Reynold W. Wilcox, M.D., LL.D. From The American Journal of the Medical Sciences, May, 1897.

Primary Sarcoma of the Lachrymal Caruncle, with the report of an additional case. By C. A. Veasey, M.D., Philadelphia. Reprint from Archives of Ophthalmology, Vol. XXVI., No. 2, 1897.

Teratogenesis. By J. W. Ballantyne, M.D., F.R.C.P.E., F.R.S.E.. Edinburgh, Oliver & Boyd. 1897.

The Action of Taka-Diastase in various gastric disorders. By Julius Freidenwald, A.B., M.D. Reprint from New York Medical Journal for May 29th, 1897.

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Original Communications.

ON THE MEDICO-LEGAL APPLICATION OF ENTOMOLOGY.[1]

BY

WYATT JOHNSTON, M.D., and GEO. VILLENEUVE, M.D., Montreal.

The remarkable results of Mégnin's[2] studies on cadaveric fauna have made medico-legal entomology part of the regular stock-in-trade of the medical expert. One may now judge from the animal fauna met with in a dead body how long it has been exposed. The creation of this special department of legal evidence is an honour which belongs to Mégnin alone, although prior to him, Bergeret[3] had already made some practical applications based on the erroneous views current at the time.

Through the publishing of his Faun des Cadavres, the popularisation of the subject has been greatly furthered, though the subdivision of the stages in the process of destruction into 8 successive stages is perhaps less easy to comprehend than the simpler classification previously adopted with 4 stages.

The result of over 15 years experience at the Paris morgue, during which period M. Mégnin had been entrusted with all the expertises requiring a knowledge of entomology, has been, according to Professor Brouardel[4], entirely satisfactory. Often the conclusions which he had arrived at from the examination of a few debris and insects were borne out in the most striking manner by the subsequent course of the case. Sometimes the mystery was never cleared up. But in no single instance did the results of the inquiry go to show that M. Mégnin's deductions were erroneous. There is something almost uncanny in the way which M. Mégnin could state for instance after

[1] Read before the Canadian Medical Association, Montreal, August, 1896.

[2] P. Mégnin Faune des Cadavres, Paris, 1894, Gazette Hebdom. de Méd. et de Chirurg., July 20, 1883; La Faune des Tombeaux, 1887.

[3] Annales d'Hygiene, 1855, Tome IV., p. 404.

[4] La Mort Subite, 1894, p. 99; L'Infanticide, 1896, p. 141.

examining a few bones and some dust that a murder had been committed during the latter part of February of the year before last —and then be absolutely justified by the dying confession of the suspected party. The chief danger to be feared from Mégnin's imitators is that they might tend to indulge in guesses having no very solid basis and to apply rules to countries and climates where they were inapplicable. We considered that before any safe deductions can be made in the case of Canada a number of comparative observations must be made to show how far the data obtained from French fauna hold good here.

It is very much to be regretted that in addition to giving the generalisations and medico-legal applications made by him, M. Mégnin has not also given us the assistance of his numerous observations which underlie these deductions, that we may know accurately the degree of variation of dates actually met with under definite conditions of experiment.

For convenience we have arranged in tabular form the dates which Mégnin assigns for different fauna to attack the body, as far as these can be determined from the literature above mentioned, though, of course, considerable latitude must continually be allowed for variations, and for this latrelation M. Mégnin is not personably responsible.

The principle is that the products formed at different epochs in the progress of decomposition attract certain forms and repel others.

The typical course of events shown by the table may be summarised as follows: While the body is still fresh it attracts the diptera *Musca*, *Curtonevra* and *Calliphora*. After decomposition has set in, the flesh flies *Lucilia* and *Sarcophaga* are attracted. Later, when fatty acids are formed, the body is invaded by the beetle *Dermestes* and by the moth *Aglossa* (this latter we have never met with in our Canadian observations, but it is apparently very common in France). Later *Pyophila* of the diptera and *Necrobia* of the coleoptra appear, as the condition becomes caseous. After this comes a period of ammoniacal decomposition marked by liquefaction of the tissues into a blackish pulp, during which stage a group of coleoptera, *Necrophorus*, *Silpha*, *Hister* and *Saprinus* are met with, as well as the diptera *Ophira*, *Tyreophora*, *Phora* and *Lonchea*. In the next stage the tissues dry up and are invaded by acari, the debris and excrement of which form a powdery deposit. Subsequently, with the progressive drying of the tissues, *Aglossa* (2nd generation) reappears, together with the moth *Tineola* and the coleoptera *Attagenus* and *Anthrenus*. Finally, when nothing but the dried ligments remain on the bones, two forms of coleoptera, *Tenebrio* and *Ptinus*, appear and devour these.

In the case of buried bodies, the fauna are said to be much less varied and to consist mainly of *Phora* and *Ophira* in the diptera, and *Philontes* and *Rhizophagus* of the coleoptera, together with any diptera which have gained access to the body before burial.

FAUNA OF DEAD BODIES EXPOSED TO THE AIR.[1]

(COMPILED FROM MÉGNIN).

	Physical Condition.	Minimum time.	Forms met with.
First Period.....	Bodies fresh.....	First three	(D) *Musca.** *Curtonevra.** *Calliphora.**
Second Period...	Decomposition commenced.....	months.	(D) *Lucilia.** *Sarcophaga.**
Third Period.. ..	Fatty acids	3 months	(L) *Dermestes.** *Aglossa.*
Fourth Period...	Caseous products.....	to 6 months.	(D) *Pyophila.** *Anthomyia.* (C) (*Cornytes.*) *Necrobia.*
Fifth Period.....	Ammoniacal fermentations, black liquefaction.....	4 months to 8 months.	(D) *Tyrcophora.* *Ophira.** *Lonchea, Phora.* (C) *Necrophorus.* *Silpha.** *Hister.** *Saprinus.**
Sixth Period.....	Dessication.	6 months to 12 months.	(A) *Uropoda.** *Trachynotus.* *Tyroglyphus.** *Glyciphagus.* *Serator.**
Seventh Period..	" extreme...	1 year to 3 years.	(L) *Aglossa.* *Tineola.* (C) *Attagenus* *Anthrenus.*
Eighth Period...	Debris.....	Over 3 years.	(C) *Tenebrio.* *Plinus.*

FAUNA OF BURIED BODIES.

Before Burial	(D) *Calliphora**, *Curtonevra*
After Burial.....	(D) *Ophira**, *Phora.* (C) *Philontes**, *Rhizophagus.* (T) *Achorutes*, *Templetonia.*

(The genera marked * in the table are those met with by ourselves.)

[1] (D) Diptera, (C) Coleoptera, (L) Lepidoptera. (A) Acari, (T) Thysanura.

The following is a list of all the species mentioned by Mégnin. Those found by us and not mentioned by Mégnin are placed in brackets. Those marked * are North American; marked † European, and those marked ‡ Cosmopolitan. ‡ † Signifies that the species is European, but the genus is largely represented in North America

Diptera.—*Musca* ‡ *domestica*, M. ‡ *Carnaria*, *etc.*, *Curtonevra* ‡ *stabulans*, *etc.*, *Calliphora* ‡ *vomitoria*, [*C.* * *erythrocephala*], *Lucilia* ‡ *Cæsar*, *Sarcophaga* ‡ *carnaria*, *S.* † *arvensis*. *S.* † *latierus*, *Pyophila* ‡ *easei*, *P.* † *petasionis*, *Anthomyia* † *vicina*, *Tyreophora* † *cynophila*. *T.* † *furcata*. *T.* † *anthropophaga*, *Ophira* ‡ *leucostoma*, *O.* † *cadaverina*, *Lonchea* † *nigrimana*, *Phora alerrimæ*.

Coleoptera.—*Dermestes* ‡ *lardarius*, *D.* ‡ *frischii*, *D.* † *undulatus*, *syn. Necrobia* [*Cornytes*] ‡ *ruficollis*, *N.* ‡ *cæruleus*, *Necrophorus* ‡ *fossor*, *N.* ‡ *humator*, *Silpha* ‡ *littoralis*, *S.* ‡ *obscura*, [*S.* * *noviboracensis*]. *Hister* ‡ *cadaverinus*, *H.* * *foedatus*. *Saprinus* † *rotondatus*. [*S.* * *assimilis*]. *Attagenus* ‡ *pellio*, *Anthrenus* ‡ *museorum*. *Tenebrio* ‡ *molitus*. *T.* ‡ *obscurus*. *Ptinus* ‡ *brunneus*, *Philontes* † *ebeninus*, [*P.* ‡ *politus*], *Rhizophagus* ‡ † *parallelo collis*. [*Omosita* * *eolon*, *Trox* * *unistriatus*].

Lepidoptera—*Aglossa* † *pinguinalis*, *A.* ‡ *euprealis*, *Tineola* † *biselliela*, *T.* ‡ *pellionella*.

Acari—*Uropoda nummularia*. *Trachynotus cadaverinus*, *Tyroglyphus spinipes*, *T. siro*. *T. longior*, *Glyciphagus spinipes*, *G. cursor*, *Serrator amphibius*, *S. necrophagus*.

Thysanura.—*Achorutes* † *armatus*, *Templetonia* † *nitida*.

Looking at the table, one is at once struck by the small number of genera and species represented out of a total of diptera, coleoptera, acari and lepidoptera occurring in France, so that in practice their recognition becomes a relatively easy matter.

It must be kept in mind that Mégnin's observations apply to human bodies. One is also struck by the absence of several forms well known to attack the flesh of dead animals, birds or reptiles; either they do not appear in the above list, or only appear at a much later date. The burying beetles, for instance, which attack game left exposed for a few days, will not attack human bodies under several months. Hence observations conflicting with Mégnin's work which rest upon observations on other animals, horseflesh for example, have, to our mind, very little practical value, what is wanted being rather multiplication of observations upon human remains, when all the conditions as to dates and meteorological conditions are accurately known. In this direction we have made some studies, which will be mentioned later, and others are still in progress. The possibility that some of the fauna may be attracted by the clothes and not by the bodies we have not found to be a serious obstacle.

Our observations now extend over a period of two years. As far as we are aware, no American or Canadian observations on this subject have been published, so that we had no direct information as to how far the dates and successions, laid down by Mégnin, might hold true of the climate of Canada. As to the comparative frequency of occurrence of various European, American and cosmopolitan genera and species there is considerably more information, though this is for the most part recorded in transactions and books not generally accessible.

To illustrate the difference in climate we have tabulated the mean monthly temperatures of the air and soil for Montreal, Greenwich and Paris and the soil temperatures for Montreal and Greenwich (the depth of soil temperature for Paris not being quite identical). The differences in summer temperature are very much less than one might expect, and this may explain the general correspondence of our results with those of Mégnin. The climate of Canada is peculiar in having a long, cold winter, (during which the ground is deeply covered with snow, which prevents the frost from penetrating deeply) followed by a hot summer. The interval between winter and summer is short. Everything is in full leaf within about a month after the disappearance of the snow, and during the warm weather temperatures from 80° to 95° Fahr. (27° to 32° C.) are not uncommon. Thus the temperature of the surface soil in summer is rather higher at Montreal than at Greenwich, and probably very near that of Paris,

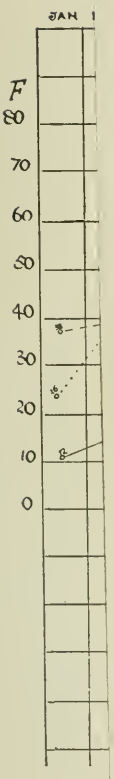

Fig. 1.
Paris— —
N.B.

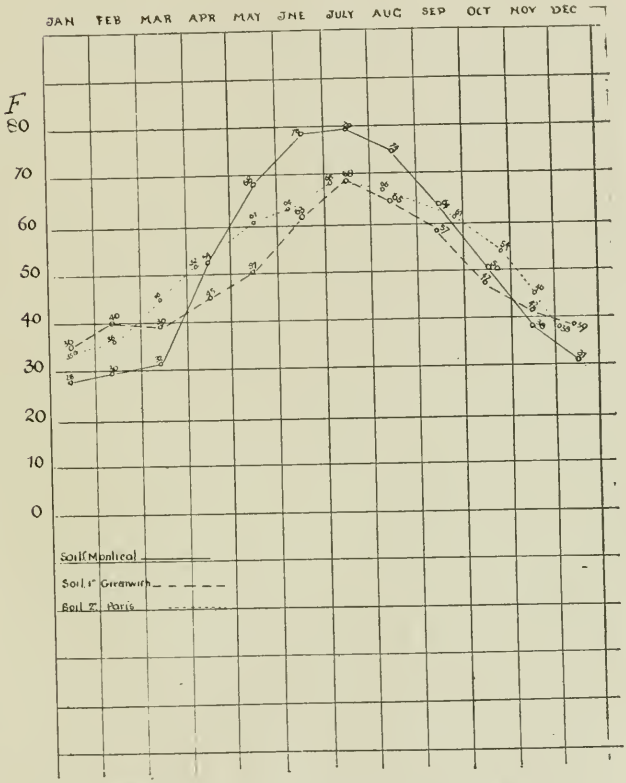

Fig. 3. Monthly means of soil temperature at Montreal 1 in. ——— Paris 2 in.— — — — — and Greenwich 1 in... .....

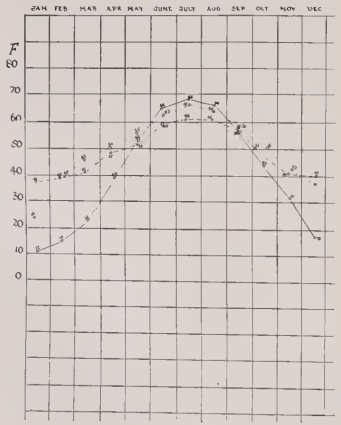

Fig. 1. Monthly means of air temperature at Montreal—— Paris— — — — — and Greenwich . . . . . .

N.B.—The charts are not drawn quite accurately as to scale.

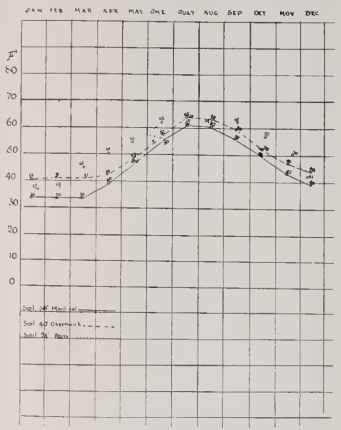

Fig. 2. Monthly means of soil temperature at Montreal 40 in.—— Paris 24 in.— — — — — and Greenwich 38 in.. . . . .

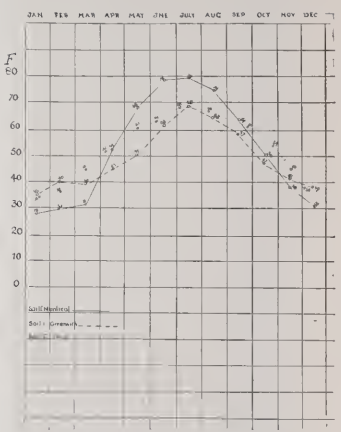

Fig. 3. Monthly means of soil temperature at Montreal 1 in. —— Paris 2 in.— — — — — and Greenwich 1 in.. . . . . .

The percentage of bright sunshine between April 1st and September 30th, is 65 at Montreal and less than 53 at Paris. From the tracings it will be seen that the mean air temperature at Montreal is slightly higher than that at Paris during the summer. The relative humidity in summer is 72 at Montreal and 71 at Paris.

	Air Temperature °Fahr., Monthly Means.			* Soil Temperature °Fahr. Monthly Means.					
	Montreal.	Paris.	Greenwich.	Montreal at 40 in.	Paris at 24 in.	Greenwich. at 38 in.	Montreal at 1 in.	Paris at 2 in.	Greenwich at 1 in.
January ...	12	26	38	36	37	40	28	35	36
February ..	15	40	39	36	38	41	30	36	40
March	24	45	42	36	45	41	32	46	39
April	40	50	47	40	50	44	54	52	45
May	54	55	53	48	55	49	68	61	51
June	64	63	60	56	63	57	78	64	63
July	67	67	63	62	64	65	79	68	68
August	66	65	62	62	64	64	74	66	65
September.	58	59	58	57	62	60	64	61	57
October....	46	51	51	52	57	53	50	54	47
November .	33	43	43	45	50	47	38	46	42
December .	18	38	41	40	41	46	31	38	39
Annual Mean...	41·8	52·0	50·0	47·6	52·0	50·3	51·8	51·8	49·5

It was suggested to us that the relatively rapid growth and development of the Canadian flora might be associated with a corresponding rapid evolution of the fauna as compared with those of Europe. This we did not find to be the case with the individual insect forms studied. We did find, however, that the successions of insect forms occurred in a shorter time on exposed bodies than we had expected from Mégnin's statements.

On the other hand we found that the order of the successions followed the rules laid down by Mégnin.

In our comparatively small number of observations, out of the 23

* The soil temperatures for Montreal are from observations by H. L. Callender and C. H. McLeod, Pro. Roy. Soc. Canada, 1895 and 1696. The soil temperatures for Paris are from observation by E. and H. Bequerel, Comptes Rendues, 1883, Tome 96, p. 1109. All temperatures were taken beneath turf. For simplicity they are expressed by the nearest whole number of degrees Fahr. The variations from the monthly means average 1° to 4° Fahr.

genera indicated by him, as characteristic of exposures up to one year, we have met with 13, and of the 10 remaining 6 are rare on this continent. We have only encountered two which he does not mention. These were *Trox* and *Omosita*, both rare in France, although necrophagous.

The diptera characteristic of the first and second periods were found by us regularly on bodies exposed during the warm months, and were not found during the cold weather, unless the body had been previously kept for some time indoors. An exception worth noting was met with in the case of a patient who escaped from an asylum on February 22, 1896, while the fields were covered with snow. The body was found on April 20, 1896, in a snowy spot in a field, and showed about the eyes and nostrils numerous small white larvæ, which on hatching out, proved to be those of *Calliphora Erythrocephala*. It is true that the development and hatching of the pupæ had not taken place. A knowledge of the period of the year at which breeding of the different insect forms takes place is of the utmost importance in determining the dates.

A deduction not mentioned by Mégnin, which we have repeatedly found of practical use, is that if empty dipterous puparia are present, the date of exposure may be reckoned as not less than one month, while the absence of empty puparia indicates an exposure of not over one month in warm weather.

Our observations conform with Mégnin's as to the order of the successions. Thus whenever acari were found, it was evident that *Silpha* and *Hister* had preceded them. *Pyophila* was only seen when saponification of the fat was well marked. *Dermestes* was seen earlier in the saponification period, but never in the preliminary decomposition. *Calliphora* and *Lucilia* were the forms met with up to the end of the first month in cases where the dates were accurately established. Where the exposure lasted a few days only, *Lucilia* was absent.

Our failure to find such forms as *Attegenus*, *Anthrenus*, *Tenebrio* and *Ptinus*, taken in connection with the fact that none of the observations reached the time limit at which they were found by Mégnin, is also confirmatory of his statements. In one case where the date of exposure was definitely fixed at five weeks, these forms were absent, although the bones of the skull were laid bare and the cervical vertebrae were stripped of their flesh and disarticulated. The inequality of the destruction in different parts of the body was striking in this case. for the state of the abdominal organs was so entirely free from decomposition that an analysis for arsenic was made, with negative results.

Whenever possible we bred the larvæ in order to determine the time necessary for the complete cycle. This was not found in any case to be lower than that given by Mégnin. It was found to be extremely difficult to obtain more than two generations. Unfortunately the pamphlet of instructions for practical entomological work, published by the Washington Bureau of Entomology was not obtained in time to adopt its valuable suggestions in our earlier observations.

In a case in which one of us (V.) was summoned as an expert, the nature of the fauna present afforded much valuable information. Early in May, 1895, the body of an unknown man was found dead in a lonely spot, with a bullet hole in the skull. There existed an advanced state of adipocere transformation, and in places the bones were partly bare. The body and clothes were swarming with small white larvæ which, from their characteristic skipping action, were thought to be those of *Pyophila casei*, and which on being hatched out subsequently proved to be so. In addition, the body and the clothing were literary covered with large dipterous larvæ and empty pupa cases. These we were not able to identify satisfactorily. No acari or coleoptera were found. The assumption of the police that the man had been murdered *during the winter* in a house near by was disproved by the evidence of abundant diptera, placing the date of exposure back to some time during the warm weather of the preceding summer or autumn. Following this clue, information was obtained which resulted in the body being identified as that of an individual who had been seen in the vicinity during the harvest season of the previous year and who was known to have a revolver in his possession. The subsequent finding of a revolver near where the body lay strengthened the original opinion of the medical examiner that the case was one of suicide.

In another case the body of a new-born male infant, found under some loose planks in the floor of a bath-room and directly over the kitchen ceiling in April, 1895, was sent to one of us (J) for examination with the statement that if the testimony of the witnesses was correct it must have been placed there on a certain night, 5 weeks previous. The supposed mother, a servant in the family had been noticed by strangers to have a suspicious degree of abdominal enlargement, though her mistress stated that she had not noticed this. After the night in question this enlargement suddenly vanished and the girl was noticed to be out of sorts for a few days. Her fellow servant who occupied the same room said that the accused had gone to the bath-room in the night "to change her socks" and had come back covered with blood. Marks of a copious bloody discharge were found

on her bedding and on her under-garments when seized by the police a month later. Unfortunately a proper vaginal examination was not consented to at the time of the inquest, though we learned subsequently that she allowed herself at the request of the coroner to be examined by a midwife, who claimed to have found a condition indicating a recent parturition. There appeared to be no moral doubt that she had been pregnant and confined in reality at the time alleged, the only question being as to the identity of the child.

The body when received for examination was in an advanced state of decomposition and was swarming with *Dermestes lardarius* in both adult and larval stages, as well as large numbers of *Calliphora erythrocephalas* larvæ and puparia of which a number were empty and some of the adult flies were found inside the coffin on opening it after it had contained the body for a few hours. The body was found on examination to be in an advanced state of decomposition. It exhaled a strong odour like that of old cheese, and the surface showed extensive pitting from the attacks of the insects. No microscopic or other evidence of acari could be found. The advanced state of decomposition made any decided opinion as to the cause of death impossible. The decomposition of the lungs was relatively far advanced, pointing to the probability of live-birth, butt oo far to let the question be decided positively. No marks of violence of the severer forms, alone recognisable under the circumstances, existed. The infant was between the 8th month and full term. There were no signs of its having been cared for.

Here we had the anomaly of very positive evidence of witnesses pointing to less than 5 weeks as the time elapsed since death, while on the other hand the state of the body, which according to Mégnin, the only authority on the subject, would require at least 3 months under favourable conditions for its production. The abundance of *Calliphora* did not correspond either with what is met with in early spring and in no other cases of one month's exposure have we ever personally met with the conditions found in this case. On the other hand the position of the body between the floors and over the kitchen was one likely to favour the drying which is so favourable to the *Dermestes*. Some experiments we made with the bodies of new-born infants showed that for the first month the *Dermestes* could not be induced to attack a body, but at the end of the second month they would do so. This latter period was the minimum and was only obtained in a dry atmosphere. The presence of the fatty acids in the vernix caseosa was thought of as a possible factor tending to hasten matters, but under experimental conditions it did not appear to make much difference.

The contradiction between the medical evidence and the theory of the prosecution was pointed out at the preliminary examination, but the case came to trial with the result that the prisoner was acquitted. In this case the circumstances were apparently contradictory of Mégnin's views but the material facts were not established so as to exclude doubt.

In another case where the body of an old woman was found lying in a field in August, 1895, there was extensive decomposition and the fatty tissues showed the adipocere change. The integument, where exposed, was parchmented and the bones of the upper extremity were exposed in places. As far as could be ascertained the body had been exposed since the middle of April making an interval of a little over four months. The insects present in this case were the diptera *Calliphora erythrocephala, Lucilia cæsar* and *Pyophila casei;* with the coleoptera *Silpha noviboracensis, Omosita colon, Hister fœdatus, Trox unistriatus* and *Saprinus assimilis.* In addition there were in parts of the body large numbers of acari not fully determined by the experts to whom they were referred but which belonged to the genus *Tyroglyphus.*

The finding in this case is decidedly what one might expect according to Mégnin as regards the forms present, though they appeared at a date earlier than that he would assign, as already stated. The presence of two forms not mentioned by him, Trox and Omosita is not evidence against the correctness of his statements as these forms are said to be rare in Europe.

Mégnin's method of computing the time interval by the *number of individuals* found and the proportion of males and females, though one of the earliest means employed by him appears to have a less solid foundation, as the number of individuals first having access cannot be positively known.

In the case of buried bodies our examinations have been confined to a few examinations for medico-legal purposes and are not numerous enough to be of any statistical value. We found that in these cases *Philontes politus* was invariably present. *Rhizophagus* was not met with. Other forms were extremely scanty except in the cases where the bodies had been kept for a few days in the warm weather before burial and as might be expected showed abundance of diptera, mostly *Calliphora.*

Some very interesting observations made by Dr. Murray Motter on buried bodies in Washington, D.C.,which will be published shortly, have been in part privately communicated to us. They show the fauna of buried bodies at Washington to be much more varied and numer-

ous than would be anticipated from Mégnin's statements as to France. The importance of comparing the results in different localities is of course very great, and we venture to think that the soil temperature may prove a better index of what may be anticipated than can be had from the atmospheric conditions of climate and temperature, both as to exposed and buried bodies.

Conclusions.—It appears certain observations and experiments upon exposed human bodies should be made in the particular locality before the present entomological data can be directly applied to legal medicine, In the vicinity of Montreal it seems probable that the deviations will be in degree rather than in kind, and concern species rather than genera. As a whole, the statements as to the fact of successions occurring and as to the general order of these successions are likely to be strengthened by further observations. Experiments with animal bodies, other than human, are apt to misleading, and adverse results under such circumstances have not very much significance. The time limits, however, apparently require modifications for the particular locality. We know very little at present as to the difference in habit of different species of the same genera.

We have to thank Messrs. Schwartz and Coquilette, of the Smithsonian Institute, Washington, as well as Professor Fletcher, of Ottawa, for having kindly determined species of diptera and coleoptera for us, Mr. A, F. Winn, of Montreal, for information as to the occurrence of North American species and Prof. C. H. McLeod, for information as to meteorology. Especially we have to thank Dr. M. G. Motter, of Washington, for very valuable assistance, as well as for information as to his personal results with the fauna of buried bodies.

THE PELVIC VISCERA IN RELATION TO MICRO-ORGANISMS IN HEALTH AND DISEASE.

BY

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The bacteriology of the genital tract in various normal conditions:

In the New-Born Child, in almost all cases, no germs are found in the vagina. Very soon, however, they enter, favoured by baths, washing, the application of oils, etc. Stroganoff states that a breech delivery of a female child favours their premature entry. Within the first two weeks gelatine-liquefying germs are rarely found.

In Girls and Women various bacilli and cocci may be found in the vagina, as well as sarcinæ, yeast fungus, etc. One of these germs is very common and is called Döderlein's vaginal bacillus. The pathogenic organisms flourish best when the vaginal secretion is alkaline; in acid conditions they are weakened in vitality or killed. As a rule no germs are found in the uterus or tubes. Menge has carried out an interesting series of experiments regarding the bactericidal properties of the vaginal secretion in a large number of non-pregnant women. He introduced into the vagina a number of pathogenic organisms, viz.: bacillus pyocyaneus, staphylococcus pyogenes and streptococcus. In all cases he found that within 70 hours they had been destroyed or their virulence greatly diminished.

He also carried out the following experiments. The vagina was carefully sterilised in the case of 70 women on whom abdominal section was to be performed. About 16 days after the operation the vaginal secretion was carefully removed and alkaline agar plates innoculated. In 62 cases the plates remained absolutely sterile. It was different, however, with specimens taken from the vulva for 66 of these gave rise to growths on the agar, only 4 being sterile. Of the 8 cases in which the vaginal secretion gave rise to growths, the germs were not pathogenic.

In 12 cases acid agar plates were also employed, cultures being obtained in 6 cases (mostly consisting of bacilli): while in the same cases only 3 cultures were obtained on alkaline plates. (These few experiments are not, however, of particular value, for pathogenic germs without exception develop in alkaline media and not in acid media.)

In another series of experiments, 12 in number, he used grape-sugar agar and obtained cultures 11 times, thus demonstrating the frequency of non-pathogenic anaërobic germs in the vagina.

Döderlein has advanced the view that the micro-organism which he has called the "vaginal bacillus," of anaërobic growth, produces an acid secretion, which is the cause of the normal vaginal reaction and prejudicial to pathogenic organisms.

Menge, however, believes that the vaginal secretion, whether alkaline or acid is bactericidal to these organisms and he believes that the acid secretion of Döderlein's bacillus plays an unimportant part in the purification of the vagina. Of more importance is acidity due to other causes (found in the new-born child when no germs are present). But a considerable role is played by phagocytes and leucocytes which enter the vagina. The chief agents are, however, the anaërobic germs and their growth-products. In proof of these statements, Menge made the following experiments. He removed the acid secretion from the vagina in sterilised holders and innoculated it with staphylococci. The latter were soon destroyed. If the secretion were previously sterilised with steam the staphylococci lived for a considerable time or were not killed at all.

If the secretion were made weakly alkaline, the cocci lived longer than in the acid solution. If the alkalised secretion were sterilised by steam before hand, the germs flourished vigorously.

Menge believes that the tissue fluids possess this bactericidal action, and that this is found in the new-born child, whose vagina is free of germs. The absence of oxygen is also an important factor.

In the order of their importance the factors destructive to pathogenic microbes in the vaginal secretion may be arranged as follows according to this investigator:

1. The antagonism between the normal vaginal bacilli and the pathogenic organisms.
2. The products of the vaginal bacilli.
3. The acidity of the secretion.
4. The secretion of the vaginal wall.
5. Leucocytes; phagocytes.
6. The absence of free oxygen in the vagina.

It is important to note that the vaginal secretion may vary greatly in its effects on pathogenic organisms. In some cases it may quickly destroy them; in others it may only weaken them or destroy their virulence, as Winter has shown. Their virulence may be retained, if the nature of the secretion be altered, *e. g.*, by dilution, by secretions

from inflammatory areas, *e. g.*, gonorrhœa in the cervix, or by the addition of solid organic debris.

Secretions poured into the vagina from inflammatory conditions in the uterus weaken the power of the vaginal secretion. In 10 cases in which there was gonorrhœal inflammation in the uterus, the vaginal secretion contained numerous streptococci. If the vagina in these cases were completely disinfected with strong antiseptics *e. g.*, carbolic acid, lysol, corrosive sublimate, and then left for some hours, the streptococci again appeared in the vaginal discharge in 3 to 6 hours. On the other hand, if at the same time the interior of the uterus were thoroughly disinfected with a 50 per cent. chloride of zinc solution, the cocci in the vaginal secretion thereafter disappeared.

As regards the normal uterine canal Menge finds that organisms do not dwell in it, though the secretion be alkaline. The cervical mucosa, according to him exercises a protective influence. He innoculated the cervical canal with streptococci and staphylococci in 15 cases and within 12 hours found the cervical mucus sterile.

The normal tube is always sterile. Menge examined 83 specimens and obtained a culture only from one, in which there was an infective endometritis associated with a carcinoma of the cervix.

As regards the influence of Menstruation.—Jacobs and others state that the vaginal organisms are increased during the period of the flow owing to the diminution in the acidity of the normal vaginal secretion as a result of the entrance of the blood. Stroganoff examined the cervix during the menstrual flow and found that in many cases it contained germs, though none that would liquefy gelatine. It is probable that some germs are washed out by the menstrual blood, and that the vaginal secretion loses some of its strength by the dilution which occurs.

In Pregnancy, the vaginal secretion is believed to be very germicidal to pathogenic organisms. Stroganoff found plenty of ordinary vaginal bacilli, but rarely germs that would liquefy gelatine. Krönig performed a number of experiments on pregnant women, introducing various organisms into the vagina. He found that the streptococcus was killed before the staphylococcus, and showed that douching of the vagina with antiseptic solutions reduced or destroyed its germicidal power, and that the use of plain water slightly diminished it. He thinks, therefore, that prophylactic syringing before confinement can do no good and may be a source of harm.

Stroganoff also found various microbes in the vaginal secretion, but none of them would liquefy gelatine by their growth.

In the Puerperium, the use of antiseptic solutions in the vagina

after labour is being discarded by many authorities, save where digital examination has been carried out, where labour is abnormal, or where operations have been performed ; and in cases where the patient may be depressed in health from various causes, *e.g.*, nephritis, heart disease, syphilis, anæmia, etc.

If, however, there be any inflammatory condition in the cervix, vagina or vulva (especially if of a possible gonorrhœal origin) there is a very strong indication in favour of employing vigorous antiseptic douches.

In Abortions, the vaginal reaction varies according to the amount of blood and debris found in the vagina. The germs also vary greatly in number and nature from time to time ; the pathogenic organisms are more apt to be found in the vagina and cervix in connection with abortions than in other conditions, probably chiefly due to the frequent digital manipulations that are carried out or to the carelessness of women in having themselves attended to.

In Old Age, Stroganoff finds various microbes in the vagina, mostly rod-shaped, and smaller, on the whole, than those found during the period of sexual life.

The vaginal secretion is only faintly acid ; in the neighbourhood of the cervix it is neutral or alkaline.

In the cervix living germs were found in about 50 per cent. of cases, though very rarely were any of them able to liquefy gelatine in their growth.

The Bacteriology of the Urethra.—Various germs may be sometimes found in the urethra in health. Gawronsky's experiments may be quoted. He made cultivations from the urethral secretion in 62 cases. In 15 of these bacteria were found, in 8 staphylococcus pyogenes albus, in 2 the bacterium coli commune. Amongst the negative cases were 10 where the women had peri- or parametritis, 6 prolapsus uteri, 3 pregnancy.

The Bacteriology of the Intestines.—Various forms of micro-organisms are found in the bowel. It is not necessary to specify these ; the germ which is of chief importance as an infective agency is the bacterium coli commune.

Relation of Micro-organisms to Pelvic Diseases.—At the present time the tendency is to attribute the great majority of inflammations which occur in the peritoneum, cellular tissue and viscera of the pelvis to the action of micro-organisms. The inflammatory processes are simply, to state the modern view, the series of phenomena caused by nature's resistance to the noxious influence of the infecting organisms. These processes are, therefore, not evil in themselves, but are bene-

ficent and purposeful. The most important germs which act as infecting agents are :

Streptococcus pyogenes (most frequent source of trouble).
Staphylococcus pyogenes aureus.
Bacterium coli commune.

The following are less often a source of trouble :

Staphylococcus pyogenes albus.
Staphylococcus pyogenes citreus.
Staphylococcus epidermidis albus.
Bacillus pyocyaneus.
Diplococcus pneumoniæ.
Tubercle bacillus.

These germs may gain entrance by the vagina, rectum, bladder, intestines, or may be carried from some distant part by the circulation.

The conditions which favour their entrance are a favourable soil, *e. g.*, a raw surface, a tissue of impaired vitality, a general condition of bad health in which the power of resistance of the tissues is reduced, dying organic matter such as blood-clot, remains of placenta or membranes.

In some cases the micro-organism *e. g.*, the gonococcus is capable of attacking the tissues and of setting up specific reaction when the individuals are in a state of perfect health. The most common source of entrance for the various germs is, undoubtedly, the vagina. They may spread into the uterus and tubes and may infect the peritoneum and ovaries ; this may take place either by an extension of infective activity along the mucous membrane or by advance as a result of germ-development in a favourable medium lying within the genital canal. They may enter a raw, injured or diseased surface and then spread to cellular tissue, peritoneum, tubes or ovaries, or even to more distant parts by means of blood-vessels and lymphatics.

The exact relationship between germ-action and various other factors which have long been regarded as causal in the production of pelvic inflammation has not yet been definitely established.

Thus menstruation has always been considered important especially in relation to the development of inflammation in the uterus, a chill or some extra exertion being considered as playing a leading role in precipitating the inflammatory processes.

Now-a-days, we are rather inclined to regard menstruation as a factor in altering the nature of the vaginal secretion, rendering it, by the addition of alkaline blood, more suitable for the growth of pathogenic germs which might enter the vagina, and making it more easy for them to spread into the upper genital tract and attack the tissues.

It is possible, also, that such influences as chill and fatigue, by diminishing the resisting power of the tissues, render them more susceptible to the action of germs.

Excessive coitus, especially at menstruation, is said to lead to inflammatory changes, especially in the uterus. There is, however, no proof that the mere physical excitement can induce these. Most likely it requires to be combined with microbial activity; the irritation of the tissues caused by the excessive movements in some measure depressing the vitality of the tissues and thus favouring infection by germs which might be present. When it occurs at the menstrual period there is also to be considered the altered nature of the vaginal secretion favouring the development of micro-organismal growth.

In some of these cases, in which the inflammation is supposed to be due to coitus, gonorrhœa is the infecting agent; either an acute gonorrhœa existing in the man or a latent gonorrhœa in the man or woman. In the former of these the virulent germ attacks the woman directly, its infectivity being unaffected by the action of coitus; in the latter the latent condition is stirred into a renewal of activity as a result of the irritation and excitement of the excessive coitus.

The Influence of Labour has long been regarded as most important among the factors causing pelvic inflammations. In the puerperium many conditions favourable to the development of micro-organisms are present. The vitality of the tissues in general is impaired as a result of the fatigue of the pregnancy and labour; the uterus is weakened by its great exertion in delivery, the condition of its circulation is greatly altered owing to the contraction and retraction of its musculature, and its tissues are below their normal standard of strength owing to the puerperal retrogressive changes which take place in them; the inner surface affords a large absorbing area; the placental site presents a number of opened blood-sinuses in which blood-clots are formed; blood-clot often lies in the uterine cavity and portions of the placenta and membranes may be left in it; the cervix, vagina and perineum are more or less bruised and very frequently lacerated.

That the bruising and laceration *per se* can start an inflammation is very doubtful and, by many, is not at all believed. Were it not for the irritation of germs or their products, wounds would heal by direct union or by granulation, without the accompaniment of inflammatory processes.

Certain other conditions in the puerperium are believed by many to lead to inflammation, viz., too early rising, walking or working. It

is very doubtful, however, if these influences can bring about metritis in the uterus directly. They act undoubtedly mainly by impairing the vitality of the tissues and thus favouring infection by germs. It is very noticeable that these conditions are, in many instances followed by no disturbance whatever. Among the labouring classes may be found a large number of women who systematically rise early after child-birth and go to work, in whom no inflammatory changes, whatever, follow.

Injuries resulting from operative measures may also lead to conditions which favour microbial infection, *e. g.*, bruises, tears, cuts; the irritation of a pessary may also act in the same manner.

The influence of all diseases which weaken the system is one which acts as a predisposing cause. It is believed by several that in certain states, *e. g.*, rheumatism, malaria, scrofula, constitutional syphilis, there is a special tendency to inflammatory changes in the pelvis, but their mode of action or their relationship to microbial action is not known. They would certainly act in one way viz., by depressing tissue vitality.

Regarding the modes of action of the various forms of streptococcus and staphylococcus, their various life-histories and the changes brought about by them in the body nothing need be said here, since these matters are fully discussed in works on bacteriology and surgery.

Different tissues are affected, different reactions brought about and different results produced. These differences depend upon the mode of entrance of the germs, their virulence, the nature of the soil on which they grow, the power of resistance of the tissues.

Special reference must, however, be made to the part played by certain specific organisms.

Gonococcus.—Since Nœggerath published his first paper in 1872, on the relation of gonorrhœa to pelvic disease, an immense amount of attention has been directed to this subject. In Great Britain, Sinclair, and in Germany, Sänger have been among the most prominent of those who believe in the profound importance of this relationship. Gonorrhœa may affect the pelvic soft parts in different conditions.

Acute Gonorrhœal Infection.—All agree that the vagina may be readily attacked by the gonococcus in childhood. There is some difference of opinion as to the areas which it may attack in the adult. For many years Bumm's views have been most widely held. He stated in 1880, that this organism could not develop in the stratified squamous epithelium of the vagina, being limited in its attacks to the urethral and cervical mucosa. This statement was based upon a number of experiments of the following nature. Active gonococci were placed in contact with the vaginal walls for 12 hours, no vagini-

tis being set up. He also excised a portion of the wall in a bad case of gonorrhœa and failed to find gonococci in it. He believed that the swelling and tenderness of the vagina, so often found in acute gonorrhœa, were due to the irritation of the discharge flowing down from the cervix.

Schwarz, Touton, Dinkler and others have strongly opposed Bumm's views and, more recently, he has modified them, stating that occasionally in the adult a true gonorrhœal vaginitis may occur in acute cases though not in chronic cases, *e. g.*, when the mucosa is in a delicate condition or thinned as in old age. Sänger holds that the vaginal walls can be affected only in children, in young girls, in old women and in the pregnant, states in which the epithelium is particularly imperfectly developed, delicate or altered in vitality.

Mandl has also carefully investigated this subject. He excised portions of the vaginal wall in three cases (aged 21, 21 and 24 respectively) of acute gonorrhœa and examined them with great care. In some parts the epithelium was very thin in its inner layers, here and there, the papillæ being quite exposed. The surface was injected and swollen and had a red, raw appearance. In many parts the epithelium, as well as the subjacent connective tissue was infiltrated with pus-cells. Gonococci were found on the surface and in the entire thickness of the epithelium, many being within the pus-cells. In several places they were detected in the sub-epithelial connective-tissue, being most deeply placed where the epithelium was thinnest.

In one of these cases the uterus was absent so that the influence of a cervical discharge on the vaginal walls was out of the question.

Döderlein has also recently described an undoubted case of gonorrhœal vaginitis after extirpation of the uterus and appendages.

Mandl believes, therefore, that there can be no doubt as to the development of a specific gonorrhœal vaginitis, though there are undoubtedly variations in the resistant power of the vaginal walls and in the degree to which they may be infected. Thickness, toughness and softness of the epithelium, the size of the interstitial spaces are important factors in determining the nature of the resistance.

In examining sections of the vaginal wall, it is important to note the period of duration of the disease. In old cases, the degenerated cocci may easily fail to take on the stains and may so be overlooked.

Very common sites of infection are the openings of the ducts of the glands of Bartholin and the small recesses about the urethral orifice. In most cases of acute infection the disease is set up in the cervix and vulvo-vaginal parts at the same time. Sometimes, the former may be at first affected; sometimes, the infection may attack the

lower structures and spread upwards, or sometimes the cervical mucosa may remain unaffected.

In some cases acute infection may spread along the uterus and tubes to the peritoneum. It may also affect, in some cases, the bladder, ureters and kidneys. It may spread to the Bartholinian glands.

Latent or Chronic Gonorrhœa in the Female.—After the signs and symptoms of an acute infection have passed away the virus may still remain in the various parts above noted, viz., the crypts about the outer part of the urethra, the ducts of the Bartholinian glands and the mucosa of the cervix. In this condition infection may spread and inflammatory reaction be set up in the whole urinary tract, the whole genital tract, and in the peritoneum of the pelvis.

It is necessary to inquire into the cause of infection in these cases. Is the gonococcus the chief factor ? Is there a *mixed infection* of gonococcus and other pathogenic germs, *e.g.*, streptococcus, or is the infection due to the latter germ entirely, they having been started into activity and having been able to spread by the favouring influence which the products of the gonococcus exert ?

These questions cannot be answered with accuracy. By many it has been believed that the gonococcus is capable of carrying infection directly to all the above-mentioned parts, both in acute and chronic conditions.

Now, the tendency is to limit the range of its activity. There are, however, many varying opinions. One fact seems to have been definitely established, viz,, that the products of the gonococcus can so alter the secretion in the vagina (rendering it neutral or alkaline) as to render it favourable to the growth and activity of streptococci and other pathogenic organisms.

Regarding the spread of an inflammation from the urethra to the bladder and, it may be, to the ureter and kidney, it is now believed by many that the gonococcus is not the infecting cause, but streptococci, which have developed under the favouring influence of the gonococcus growing in the urethra.

With regard to the occurrence of inflammation in the Bartholinian glands, some believe that the gonococcus may be directly responsible, while others hold that it is the other cocci to which I have referred. I think that while the infection is due to streptococcus in most cases, it may also arise from the gonococcus entirely. The gland is lined with a single layer of cylindrical epithelium—the site most favoured by the gonococcus, and the organism itself may be found in the gland in some inflammatory conditions. It is, however, very difficult to

eliminate the influence of the pathogenic germs, as they can, in these cases, so easily gain access to the gland.

As regards the uterus, there seems little doubt that inflammation may be set up in it by the action of the gonococcus, though as to the frequency with which this occurs, and as to the conditions under which it is most likely to take place, accurate knowledge does not exist. In many cases of uterine inflammation, which clinically might be attributable to the influence of the gonococcus, the germ cannot be found at all. No doubt, in some of these cases the infecting agent is some other organism, *e.g.*, streptococcus.

It must be stated here, however, that Bumm, Gottschalk and Immerwehr have recently reported that in a considerable number of cases of uterine inflammation they could not find any germs in the secretions from the uterus. Menge also reports that examinations of scrapings of the uterine mucosa in 73 cases of endometritis revealed micro-organisms, including the gonococcus and tubercle bacillus only in a proportion of instances. These statements do not, in any way, prove that the infecting agency was not in these cases of microbial nature. We do not yet know how they act in keeping up chronic irritation, nor how numerous they need be to affect a considerable area. It may be that in chronic conditions a few foci in the tissues may serve to diffuse an irritating influence sufficient to continue the altered activity of the tissues. If this be true, it is easy to understand why the microbes might but rarely be found in the secretion obtained from the uterine cavity and why, indeed, they might only occasionally be found in curetted parts of the mucosa.

In some cases the infection of the uterus may be directly due to the action of the gonococcus along with the streptococcus or other of the pathogenic organisms.

It is important to note that the uterine cavity may become the seat of marked microbial development, if it contain detritus from a new growth, from retained membranes or placenta, or if the mucosa be injured.

As regards the Fallopian tubes, there is ample proof for believing that the gonococcus may infect it and lead to inflammatory changes. A. Martin believes that the infection may travel not only directly through the lumen of the genital tract, but also through the lymph channels and connective tissue spaces in the parametrium.

Here, as lower down in the genital canal, inflammatory changes may result from mixed infection, the gonococcus and streptococcus being both active, or the latter being the chief cause developing in

the lumen under the favouring influence of the products of the gonococcus.

It is interesting to note the results of Menge's examinations of diseased tubes. In 30 cases of hydrosalpinx and 3 of hæmato-salpinx no cultures could be obtained. In 122 specimens of purulent salpingitis he obtained the following results :

In 75 cases the tubes were sterile.

In 28 cases gonococci were present.

In 9 cases tubercle bacilli were present.

In 3 cases streptococci were present.

In 1 case staphylococci were present.

In 1 case bacterium coli commune were present,

In 1 case saphrophytes were present.

In 1 case anærobic bacteria were present.

In 3 cases various bacteria were present (in one case with streptococci.)

He found that 10 cases of pyosalpinx were absolutely sterile, thus differing very decidedly from Boisleux and Witte, who state than an abundance of germs were found in such cases.

There can indeed be no doubt that in the great majority of cases the contents of a pyosalpinx are absolutely sterile.

Kiefer states that generally pus collections in the tubes become sterile in 6 to 12 months, the cocci being probably killed by their own toxins. It is important to note, as Olshausin points out, that with the onset of fresh infection or exacerbations new cocci may be introduced and the infectivity of the pus increased.

In regard to the pelvic peritoneum, Sänger believes that the gonococcus is only capable of setting up localised pelvic inflammation, *e.g.*, periovaritis, perisalpingitis. He thinks that it cannot initiate a wide peritonitis, which he believes due to a mixed infection, the active agent being streptococcus or some other organism. The gonococcus does not appear to survive long in the peritoneal cavity.

Winter is also of this opinion and states that general acute peritonitis is never caused by the gonococcus. Kiefer also observed 11 cases, in which fresh gonorrhœal pus escaped into the peritoneal cavity without any reaction taking place, whereas virulent pus containing streptococci, or staphylococci always caused a reaction.

Several observers have pointed out the frequency of localised pelvio-peritonitis after removal of pus-tubes. This may be due to foci present before operation in the peritoneum or cellular tissue, to oozing from the uterus through the interstitial portion of the tube, or to fresh infection with bacterium coli.

As regards pelvic cellulitis, it is believed that the gonococcus may be the infecting agent sometimes, but that in the majority of cases one of the other organisms is the cause.

The same may be stated in regard to the ovary.

Menge found in 8 cases of ovarial abscess that the gonococcus was present in 3, the tubercle bacillus in 2, and streptococci in 1 ; the other three cases being sterile. Kiefer found the *bacterium coli* in several cases.

Sänger has laid great stress upon the marked liability of pregnant and puerperal women to contract acute gonorrhœal infection and, also, on the tendency towards the development, in these conditions, of an acute exacerbation of what was once previously a slight inflammatory process. Thus, a latent condition may develop into an acute outbreak in pregnancy or the puerperium without the inciting influence of any fresh infection.

Sänger also points out that in the puerperium a special variety of acute inflammation of the tubes and ovaries of a pure gonorrhœal nature, may be due simply to a recrudescence of an old gonorrhœal trouble, without any freshly acquired infection.

It must, however, be remembered that similar phenomena may be produced by the action of septic organisms which find a favourable condition for development where gonorrhœa, recent or latent, has altered the state of the secretion in the genital canal. Possibly, therefore, some of the cases referred to by Sänger are of this nature.

Latent Gonorrhœa in the Male.—The particular work carried out by Nœgerath was to point out the importance of latent gonorrhœa in the male as a prominent factor in the production of various forms of inflammation in the female pelvis, *e.g.*, endometritis, salpingitis, ovaritis, and localised peritonitis. He pointed out what is now generally recognised, that the male urethra may remain the source of an infective power long after all apparent signs and symptoms of acute gonorrhœa have passed away. This power resides in a discharge produced by the remains of the original gonorrhœal infection, and is probably limited to the crypts of the mucous membrane. The excitement of marriage, of alcoholic indulgence, or of over-fatigue may stimulate these areas of latency into renewed activity and, as a result, the woman after coitus may be infected in the various ways already described by me. The manner in which the infection is brought about is not clearly known. In many of these discharges from the male urethra no gonococci can be found. Very probably, in such instances, the discharge may act by modifying the vaginal or uterine secretions so as to afford a suitable medium for streptococci or other

infective germs, which may spread upwards and lead to the various disturbances which I have described. Very often a perfectly healthy woman may be infected as a result of this latent gonorrhœal condition in the male, the most distressing pelvic troubles developing soon afterwards.

Gonorrhœal infection of the mucosa of the rectum may follow immediately upon an infecting coitus, or it may afterwards follow as a result of the entrance into the bowel of gonococci from the vulvar discharges. Rarely it may follow rupture of a Bartholinian abscess into the rectum. The inflammation may be followed by an ulcerated condition.

Bacterium Coli Commune.—This organism, first described by Escherich in 1885, is believed to be the most frequent infecting microbe which may extend from the intestinal tract into neighbouring parts. It is of great importance in relation to general peritonitis, as has been shown by Treves and others, but it also plays some part in local pelvic inflammatory affections. According to the researches of Vignal and others, this organism is found in the whole alimentary tract. Normally, it is believed to number about 95 per cent. of all the organisms in the bowel (Treves).

According to Tavel and Lanz there are many varieties of this organism, and also corresponding differences in its virulence. According to the experiments by LeSage and Macaigne a culture outside the body is harmless and will not set up peritonitis when placed in the peritoneal cavity of animals, because under normal conditions the germ is not virulent.

It may, however, become virulent under various conditions, *e.g.*, in weakened, diseased or injured states of the wall of the gut, such as obstruction, strangulation, congestion, diarrhœa, compression, bad constipation, etc.

If in such a condition of virulence, a culture of the germ be made, it has a distinct influence when placed in the peritoneal cavity of animals, varying according to the degree of toxicity. Thus it may only lead to slight constitutional disturbance with diarrhœa; a localised purulent peritonitis may be set up; or in some cases acute septicæmia may lead to death before any local signs of peritonitis are developed.

P. Ziegler has pointed out that normally the bacterium shows no tendency to pass through the bowel wall; if however, the vitality of the wall be impaired, in addition to becoming virulent, it at once begins to penetrate the wall and may extend into surrounding tissues for a considerable distance.

When the bacterium reaches the peritoneum it may set up an inflammatory reaction varying in extent according to its virulence (as well as other conditions).

Paul Ziegler has shown that its activity is increased there, if fluids, especially blood, be present in the peritoneum. It is also accentuated, as Laruelle has pointed out, if the intestinal secretion be present, even though the latter be artificially sterilised. This germ is generally the cause of peritonitis in hernial sacs, in obstruction and strangulation, in appendicitis cases and other intestinal conditions.

Freshly filtered fluid from the normal bowel introduced into the peritoneum generally sets up peritonitis. The cause is the bacterium coli. According to Barbacci the peritoneal endothelium is damaged by this fluid, thus favouring an infection by the germs; and I have already pointed out that the activity of the microbe is increased by the presence of the intestinal fluid in the peritoneal cavity. If the fluid be in any quantity it has a depressing influence on the system on account of the absorption of the toxins in it.

The bad effect of fæces when introduced into the peritoneal cavity is due to the presence of microbes, especially the bacterium coli, in it. If sterilised fæces be introduced no bad result follows.

It is likely that a considerable proportion of local pelvic infections in women are due to this bacterium and it is possible that in nulliparous women the frequency of retro-uterine inflammation is related, not to infection from the uterus in the great majority of cases, but from the rectum.

The overstretching of the rectum from constipation, so common in women, the continual soaking of the wall in this state with toxic matters in the bowel-contents, the occasional occurrence of cracks and ulcers in the rectal wall are all factors which favour the passage of the bacterium coli into the utero-sacral ligaments, surrounding cellular tissue and peritoneum and even the uterus.

Tubercle Bacillus.—Tuberculosis in the genital tract may be set up in a variety of ways.

1. It may be primary, *i. e.*, the bacilli may enter from the outside by way of the vagina, being introduced by dirty instruments, by examining fingers, by sleeping with a tubercular person, by coitus with a man suffering from genito-urinary tuberculosis. In such cases, the vagina and cervix may be first affected, the disease spreading afterwards along the uterine and tubal mucosa; or the upper genital tract may sometimes be first attacked, according to Whitridge Williams, the bacilli entering a denuded surface on the vaginal wall and being carried up by the lymphatics.

2. The genital organs may become affected by the direct spread from neighbouring tuberculous areas, *e. g.*, tuberculosis of bladder or bowel; ulcers may perforate or abscesses burst leading to fistulous communications.

W. Williams states that one of the most frequent sources of genital tuberculosis is tubercular peritonitis. Weigert has shown that in this disease the bacilli which become free in the peritoneal cavity tend to sink into the pelvis setting up infection; they are there in the best position to be swept towards and into the tubes and they may undoubtedly be carried into the tubes setting up disease without infecting the pouch of Douglas at all.

3. The bacilli may be introduced directly into the vagina when the patient has tuberculosis in some other region, *e. g.*, urinary tract, intestines, lungs, the infection spreading from the discharges.

Hegar has pointed out that genital tuberculosis is rare in childhood and after the climacteric.

Infection by men suffering from genito-urinary tuberculosis is of considerable interest. Derville reports five cases in which the husbands of women with genital tuberculosis had tubercular epididymitis. Fernet reports four cases in which men with pulmonary tuberculosis infected their wives, but we do not yet know whether the semen in such cases may contain tubercle bacilli. Landouzy and Martin mixed the semen of a guinea-pig which had died of tuberculosis with salt solution and injected the mixture into the peritoneal cavity of 15 guinea-pigs; five died of tuberculosis. Curt Jani found very few bacilli in apparently healthy testicles and prostates of several persons with tubercular phthisis. Gärtner in reference to Jani's description states that in tubercular patients, before death occurs, the bacilli may spread to various parts of the body and hence in this stage may often be found in the blood.

Spano injected semen from a tubercular man into the abdominal cavity of eight guinea-pigs and produced tuberculosis in six cases. In two other cases by injecting it into the vagina, genital tuberculosis was caused.

Mafucci injected large doses of bacilli into the jugular vein of a dog and found them afterwards in the semen of the animal.

Rohlff, however, introduced semen from a tubercular man into the anterior chamber of the eyes of goats and rabbits with a needle puncture and got no result; but the amounts injected were very slight and goats are not very susceptible to tuberculosis.

Westermeyer introduced testicular tissue from a tubercular patient

into the peritoneal cavity of rabbits without setting up tuberculosis, but he was not able to distinguish tubercle bacilli in microscopic examination of the testicles. In a case of acute miliary tuberculosis in which bacilli were found in the testicle, injections of portions of it into the peritoneal cavity caused tuberculosis in the rabbit.

Walter examined several testicles in cases of phthisis and found no tubercle bacilli in them. Gärtner believes that they are very scanty in the semen in such cases. He injected tubercle bacilli in the trachea and lungs of male guinea-pigs, setting up infection, and after three or four days obtained semen from their testicles. In 32 cases, he found tubercle bacilli only in five, and the semen in these few instances, when introduced into the peritoneum of other animals, set up only a mild form of tuberculosis.

In another set of cases he set up tuberculosis in the testicle by local injection and found that in 50 per cent. of the animals into which he introduced the semen from these cases, severe tuberculosis was set up. Gärtner, therefore, believes that genital tuberculosis in the male is a very much more serious danger for the female than distant tuberculosis.

The various parts of the genital tract, including the ovaries, may be affected, though the vulva and vagina are very rarely attacked. Sometimes a mixed gonorrhœal and tubercular infection may take place. Pyosalpinx may develop in tubercular salpingitis (? due to a combined septic infection).

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A CASE OF MYXŒDEMA.

BY

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Mrs. M. L., æt. 53, was admitted to St. Francis Hospital, Sept. 14th, 1896. She complained of weakness, unsteadiness and awkwardness of gait, clumsiness and numbness of fingers, cold feelings in legs, noises in the head and dizziness.

History—In November, 1895, she was told that her face looked swollen. She felt, about this time, some irritation of the eyes. Shortly afterwards a stiffness of the muscles, especially those of the arms, was felt, and her skin felt " hide-bound." In April, 1896, she, and others, noticed that her speech was slow and thick. The symptoms gradually increased up to the date of admission.

Personal History—She is a native of Ireland, and has lived in Wisconsin since the age of 14 years. She married at 21 and has had twelve children. All but the second, third and seventh died at birth, or very shortly after. The third and seventh are still living ; the second died at 30, cause pleurisy. She had malaria for 14 weeks at the age of 14 years.

Present Condition—The patient is a medium sized women ; general nutrition is good ; and she is able to be up and about. The facial expression is dull and sleepy. She talks intelligently, but her speech seems to require considerable effort and is slow and thick, the voice being drawling, husky and somewhat nasal in character. One's first impression on seeing her is that the entire body is œdematous, and that pitting is easily produced ; but on palpation the skin is dry, and instead of pitting one meets a somewhat firm, elastic resistance in the tissues beneath the thin parchment-like skin.

The skin looks scaly, though there is no actual scaling. The hair on her head is sparse, dry and brittle.

There are no clinical evidences of disorders of the functions of any of the organs.

On this date (Sept. 14th, 1896,) she was given 5 gr. thyroid tablets three times a day.

On Sept. 19th she complained of feeling ill and weak. The pulse became quickened (98) and the temperature, from being subnormal (97°), reached $102\frac{3}{5}°$. The tablets were temporarily stopped.

21st Sept. Clinical note—" Skin appears softer and more flexible

subcutaneous tissue less resistant ; face and hands smaller and show more of the natural wrinkles."

The tablets were resumed, only from one to two being given daily.

At the end of September she went to her home in Iowa. She was very much improved. The skin had lost that dry transparent look which it had previously had. She perspired naturally. The subcutaneous tissue thickening was much lessened. She moved with much greater celerity and the numbness had nearly entirely disappeared from feet and hands.

The voice was clearer and she declared that the feeling of dulness and slowness of mental processes had entirely disappeared. She continued to take one five gr. tablet daily.

In January, 1897, she returned to the hospital to report and appeared quite well. About six weeks ago she wrote that she was as well as ever she had been. She takes constantly 1 tablet (gr. v) daily.

REPORT OF SIXTY-EIGHT CASES OF TYPHOID FEVER DISCHARGED FROM THE ROYAL VICTORIA HOSPITAL DURING THE YEAR 1896.

BY

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Resident Physicians.

During the year 1896, sixty-eight cases of typhoid were discharged from the Royal Victoria Hospital. Of these, six cases were admitted previous to January 1st, 1896.

With the exception of two cases, all were treated to a conclusion. One of these latter cases was a Chinaman, who was taken home by his friends to be given the regular Chinese treatment, and the other, a woman in the 34th week of pregnancy, left to be confined at her own home. It was afterwards learned that both of these cases made a satisfactory recovery.

In addition to the above there were five cases remaining on Jany. 1st, 1897, but these are not included in the subjoined statistics.

There has been no fatal case during the year.

With regard to treatment, hydrotherapy has been employed as a routine practice. The graduated baths were given, the patient being immersed at a temperature of 90° for 15 minutes, and the water rapidly cooled to 80°. After the first bath the patient was immersed at 80° and the temperature reduced to 70°, or in some cases to 65°, if the condition of the patient was not a contra-indication.

Baths were given every three hours when the temperature remained above 102.3.

Of the 68 patients treated during the year, 47 were given baths. In 7 of these cases the baths were discontinued ; in two because the pulse became rapid and feeble, and there was marked cyanosis while in the bath ; in another on account of phlebitis. One patient complained of severe neuralgic pains during and after the bath ; in another case, during a relapse, on account of abscess formation. One case, a child, was too refractory, and in another case, also a child, the signs were those of a meningitis, rather than those of typhoid in the earlier part of the illness.

In most of these cases sponging was substituted for the bath.

The average duration of the bath treated cases was 48.9 days ; the average number of baths given to each patient was 21.8, the greatest number in any case was 79, while the least number was one.

In 21 cases baths were not given ; in 12 of these the temperature was such as to render bath treatment unnecessary ; in 5 cases the diagnosis was not clear ; in one case, pregnancy, in the 34th week, was thought to be a contra-indication ; in another case the fever followed confinement and was complicated by acute parenchymatous nephritis ; while two cases were admitted so late on in the disease that it was thought advisable not to begin bath treatment.

Of the 5 cases in which the diagnosis was at first not clear, sponging with ice water was resorted to whenever the temperature reached 102.3. In a few cases Yeo's euchlorine mixture was given, but additional measures were rarely employed save that when constipation was present at the onset a calomel purge was given.

Milk diet was strictly maintained throughout the earlier stages of the disease, but when the fever showed signs of abating weak coffee or cocoa and, in some cases, broths were given in addition.

The average duration in hospital was 45.4 days.

The average duration of the febrile period was 23.9 days ; the longest febrile period in any case was 84 days, while the shortest period was 3 days.

As regards the symptoms, in addition to the elevation of temperature there was a distinct eruption in 78 per cent. of the cases, and in 66.2 per cent. of the cases the spleen was palpable.

Diarrhœa was present in but 8 per cent of cases, while constipation, necessitating the administration of enemata, was present in the balance. Relapses occurred in but 8 cases, the average duration of which was 19.7 days. In no case was there more than one relapse. The symptoms of these relapses were as follows: In one case a typical elevation of temperature, accompanied by a subacute bronchitis ; in two other cases, elevation of temperature only ; in four cases, in addition to elevation of temperature, there was enlargement of the spleen, and in the remaining case there was elevation of temperature, enlargement of the spleen and a most diffuse eruption. In this last case the eruption during the first illness had been very scanty. The longest febrile period in any relapse was 42 days, and occurred in the last mentioned case ; the shortest febrile period was 11 days. The longest period at which a relapse occurred after normal temperature had been reached was eight days. In several of these cases the cause of the relapse was thought to be solid food which had been smuggled in to the patients by their friends, while in the others no definite cause could be assigned.

Complications occurred in 30 cases and were as follows : In two cases there was subacute mania, in one towards convalescence in a

neurotic individual, and in the other at the outset. In one case an abscess developed in the cheek and this was followed by facial erysipelas, which necessitated remaining in hospital at least three weeks longer than would otherwise have been the case, and in addition this patient developed an epididymo-orchitis. In 9 cases there was acute or subacute bronchitis, and in one of these, in the patient longest in the hospital, there was in addition a subacute nephritis. In one case there was pericarditis and towards convalescence phlebitis, and in two other cases phlebitis occurred, in one of which there was also septicæmia. In two cases there was myocarditis ; in one of these, during convalescence, measles and chicken-pox, and in the other acute suppurative otitis media. This latter complication also occurred in two other cases. Nephritis occurred in 4 cases, in three of which it was subacute and in the other acute parenchymatous coming on with the fever and following confinement. Furunculosis occurred in 3 cases. Cultures from the pus showed staphylococci in all. There was one case of intestinal hæmorrhage, one case in which chicken-pox developed, one case of peripheral neuritis and one case in which the illness occurred late on in pregnancy.

The following is a brief account of the more severe cases :

Typhoid, ushered in by rigors, and complicated in the third week by hæmorrhage, with signs of collapse the following day.—T. O., æt. 43, was admitted Dec. 21st, 1895, complaining of headache, weakness, pain in the back and loss of appetite, commencing, he said, 17 days previously with chilly feelings which, in a few days, became actual rigors, lasting from 3 to 5 minutes, occurring two or three times each hour, day and night, and continuing altogether about a week. Accompanying the above was violent headache and pain in the back and limbs. During the second week he had no chills, but he suffered from severe headache, loss of appetite, gradually progressive weakness, slight diarrhœa and crampy abdominal pains.

On examination the patient was found to be emaciated and anæmic, with an anxious drawn expression. There was general nervous tremor, and owing to dryness of the mouth and tongue, some difficulty in speaking. There had been rapid loss of flesh. The tongue was heavily coated and the breath foul. Temperature, 102° ; pulse. 112 ; respiration, 24. The pulse was of low tension and dicrotic. There was a short, rough murmer at the aortic cartilage and the aortic second sound was accentuated. There were a few sibilant rales in the lungs. The abdomen was distended, there were a few rose spots, and the spleen, although apparently enlarged on percussion, could not be felt. The urine contained considerable albumen.

Four days after admission he had a hæmorrhage, but as it occurred with a stool the quantity could not be estimated. After the hæmorrhage there was no sign of weakness, no change in colour. The pulse and respiration were not apparently altered. There was no fall in temperature and the patient looked as if nothing had happened. Twelve hours later the patient showed signs of collapse. The pulse became rapid, small and weak, the extremities cold, the skin blanched and bathed in perspiration. Two hours afterwards the temperature could not be taken per rectum, and it was not until late in the afternoon that the thermometer would register. No more blood was passed, and the stool the following day, although black, did not contain free blood. Soon after the patient began to improve gradually, and was discharged without further misfortune.

Typhoid, with stupor followed by delirium, and complicated by acute bronchitis and sub-acute nephritis.—E. T., æt. 50, was admitted from the out-patient department, May 22nd, 1896, complaining of gradually progressive weakness, which began three weeks previously. During this time she had at intervals suffered from headache, loss of appetite, sore throat, and pains in the limbs. She had had occasional asthmatic attacks.

On examination she was found to be well nourished and healthy looking. The face was flushed, lips dry, tongue clean. Temperature, 103° ; pulse, 100 ; respiration, 20. The lungs showed evidence of chronic bronchitis and emphysema. The pulmonary second sound was reduplicated, the abdomen was distended and the spleen was readily palpable. The urine was acid—1020—and contained albumen and casts.

The subsequent course of events was as follows : During the first ten days in the hospital the patient was dull and apathetic, then she became stuperose. The angle of the mouth was drawn to the left side, but the tongue was protruded straight. It now became dry, furred and fissured. The patellar reflex could not be obtained. This condition gave place in a few days to active delirium and it was with great difficulty that the patient could be kept in bed. The least noise in the ward would cause her to scream loudly and there was considerable volitional tremor. The examination of the lungs at this time showed a fairly acute bronchitis. For ten days the patient was in this condition, some days of course being worse than others. Gradually she became rational, but convalescence was very tedious although uneventful, and she was discharged after having been in the hospital 118 days.

Typhoid, accompanied by phlebitis, repeated rigors, unusually high temperature, and the presence of staphylococci in the blood.—P.C., aged 20, was admitted August 31st, 1896, complaining of loss of appetite, headache, pain in the back, and general weakness.

For ten days patient had felt out of sorts but was not confined to bed until 4 days previous to admission, during which time she suffered from severe frontal headache, vomiting, pain in the back, marked prostration, and had some elevation of temperature.

On examination she was found to be anæmic, but with a fair amount of subcutaneous adipose. The lips were dry and cracked, the tongue was large, flabby and coated. Temperature, 102.3 ; pulse, 124 ; respiration, 36. There was a faint systolic murmur at the apex. The abdomen was full and the spleen readily palpable, but rose spots were nowhere visible. The urine contained a trace of albumen. In this case the fever ran a moderate course during the ten days following admission, then a phlebitis developed, slight at first, but it having increased considerably in a few days, the baths were discontinued and sponging substituted. Nothing further of importance occurred until the 16th day after admission, when, without warning, the patient had a severe rigor lasting 20 minutes, the temperature at the time of the rigor being 106.3. On the following day she had another rigor, with temperature 105°, and two days later two rigors, the temperature in the first being 105° and in the second 106.1°. Cultures taken from the blood at this time showed at the end of 24 hours staphylococci, while cultures taken repeatedly previous to this were sterile. The general condition of the patient at this time was very poor. There was low muttering delirium, twitching of the fingers and picking at the bed clothes. The pulse was rapid and feeble and the free use of cardiac tonics, *e.g.*, alcohol, strychnine and digitalis was resorted to. It was not until 30 days after admission that the patient entered on a period of convalescence, which though very protracted and tedious, was otherwise uneventful.

Typhoid, preceded by acute dysentery ; Complicated by bronchitis, epididymo-orchitis, non-specific urethritis, alveolar abscess, and facial erysipelas.—J. P., æt. 21, was admitted Oct. 12th, 1896, complaining of pain all over, headache, general weakness and cough. Three weeks previous to admission patient was seized with an attack of acute dysentery which lasted for a week, and for another week the dysenteric condition was present but not nearly so acute. For a week there had been progressive weakness and pains, and the day before admission severe headache and cough.

On examination the patient was found to be a well nourished but

anæmic young man, dull and apathetic. The cheeks were flushed, there was some cyanosis, the skin was hot, the tongue coated and the teeth covered with sordes. Temperature, 103.3° ; pulse, 80 ; respiration, 20. There was a subacute bronchitis, a systolic murmur at the apex transmitted into the axilla and another at the base. The pulmonary second sound was accentuated. The abdomen was distended and tender, there were a few rose spots and the spleen was palpable. The urine contained albumen.

During the two weeks following admission the course of the fever was moderately severe, and during this time, save for bronchitis, there was no complication. In the third week an epididymo-orchitis developed, and with it a bloody purulent discharge, in which neither gonococci nor tubercle bacilli were present, and which had not been present on admission. In the sixth week a swelling developed in the cheek, a tooth opposite this was extracted and a quantity of pus escaped, but drainage not being free an opening was made a few days later from the outside. Thirteen days afterwards erysipelas set in at the site of the incision, and it was not until the end of three weeks that the patient could be discharged. In all he was in hospital 81 days.

Typhoid, with development of sub-acute mania during convalescence.—J. L., æt. 26, was admitted Oct. 10th, 1896, complaining of weakness and pain in the back. One week previously he began to suffer from headache, chilliness, general weakness, pains and loss of appetite, but did not take to bed for several days. The bowels had been constipated,

On examination he was found to be well nourished and intelligent, but neurotic. The tongue was coated and the teeth were covered with sordes. Temperature, 101° ; pulse, 92 ; respiration, 24. The abdomen was distended and tender, and the spleen was readily palpable. There were no rose spots. The course of the fever was very mild, the highest temperature at any time being 102°. After the temperature had been normal for five days, the patient was noticed to be very nervous. This was attributed to his having heard some blood curdling stories related by an ex-patient. The following day he had minor delusions and in the evening fancied he was going to die. For nearly two weeks, at times, he became almost maniacal and made several attempts to escape, but eventually he returned apparently to his right mind, although it is to be noted that several weeks after going home his mind became deranged again and he was removed to Verdun.

Typhoid, following an attack of the same disease six weeks pre-

viously, and setting in with despondency, which in a few days was replaced by delirium and sub-acute mania.—D. L., æt. 23, was admitted Nov. 3rd. 1896, complaining of loss of appetite and despondency. He was brought to the hospital by his friends. Regarding this patient, it may be said that he was discharged one month previously, after having been in hospital for an attack of typhoid fever, lasting six weeks. For two weeks before discharge he had had a normal temperature. One week before readmission his friends noticed that he was despondent, at times easily excitable, and on the previous day he was delirious. For several days he had had a poor appetite, with occasional vomiting, and at times complained of headache.

On examination he was found to be apathetic and dull and could not answer questions rationally. There was some conjunctivitis, the lips were dry, tongue coated, and bowels constipated. Temperature, 98.2 ; pulse, 112 ; respiration, 24. The pulse was dicrotic. There was a systolic murmur at the apex, not transmitted into the axilla, and another at the base ; the pulmonary second sound was accentuated. The abdomen was distended. There were numerous rose spots and the spleen was palpable. The urine contained albumen but no casts could be found. During the first 24 hours after admission, the temperature reached 103.2°, and the fever ran a moderate course. The mental disturbance disappeared with the fall of the temperature.

AN OBSCURE CASE OF PURPURA HÆMORRHAGICA WITH INFECTION BY THE BACILLUS AEROGENES CAPSULATUS.

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It may be said that the great majority of cases of purpura are obscure. While we may observe the clinical aspects of such cases and classify them according to outstanding features presented by this case or by that, yet there come, and these not infrequently, cases conforming to no type. On the other hand a given case manifests classifying points of a variety of cases during the course of its development. Obscure must they remain until by the aid of added research some ætiological factors are discovered, some certain basis of classification established.

The case which is here reported has some of the clinical features of those described and designated by Henoch as "purpura fulminans" but it differs from them in its duration and in its hæmorrhagic features.

T. S., æt. 22, student in arts at McGill University, was admitted to the Royal Victoria Hospital on the morning of Nov. 7th, 1896, complaining of spitting of small quantities of blood and of spots over his body.

He was a well developed and a well nourished young man. He had never resided outside his native province, Quebec. His health had been good with the exception of sickness due to measles, mumps, whooping-cough and chicken-pox in his childhood. Besides the eruptions due to these diseases he described a bright red itchy papular eruption which came out in the spring of 1895. This became pustular in part and disappeared at the end of four weeks. The history is altogether negative, touching the points of hæmophilia, malignant disease, previous attacks, rheumatism, venereal disease, use of drugs, alcohol, tobacco and privation. It seems probable from his statements concerning his family that tuberculosis affects one brother. Beyond recurring hæmoptysis in this member and an attack of hæmatemesis in a paternal aunt there was no evidence of hæmorrhagic diathesis.

History of onset and condition of patient.—On Nov. 2nd, without any premonitory malaise, a few bright red spots of the size of a pin's head were first noticed about the left ankle. From this time until the next evening they became numerous over both the lower extremities. Three days afterward a few spots were observed on the arms, then the chest showed similar areas, the abdomen remaining free until after the 7th. A slight knock at any part induced the appearance of extensive and severe bruising. So far as can be ascertained the patient was not feeling ill or weak during these four days, but in the night of the fourth day he was awakened by flowing of blood from mouth and with coughing and spitting up blood.

On the afternoon of the following day, 7th, he lost large quantities of blood, from nose, mouth and throat, and for the first time felt weakness, rawness of the throat and slight pains in the knees.

Examination of surfaces.—There were the spots already referred to, which were distinctly hæmorrhagic. Besides these small hæmorrhages, which were most numerous on the lower extremities, there were those of similar size on the face, neck and trunk, the abdomen possessing least. Here and there appeared larger purpuric areas varying in size and colour. In a largedark red patch on the left arm two nodules about the size of a pea were noticed. The conjunctivæ presented a few hæmorrhages. The nose was slowly but constantly bleeding. The lips were of good colour. The gums were not spongy. On the soft palate and left tonsil hæmorrhagic areas were seen. The pharynx was congested: there was no glandular enlargment except at the angle of jaws.

The constitutional condition.—Mentally the patient was clear: Temperature $102\frac{2}{5}$, pulse 100, respiration 24.

The blood, etc.—Cultures on agar-agar and in broths were negative microscopically. A few (1 or 2) days before death, the blood showed lymphocytes as the chief form of leucocyte, but one polynuclear cell being found in a search over three sides. Blood count r. c. 4,840,000, w. c. 6,000, hæmoglobin 87%. The circulatory, respiratory and digestive as well as urinary systems were all negative at the primary examination. Ocular fundi negative.

Progress of case.—The patient was under observation for five days, during which a constant and remarkable increase in the gravity of the case was noted—in the varying temperature, quickening and weakening pulse, in the persistent and intractable hæmorrhages, both sub-cutaneous and from the mucous membranes, in the occurrence of hæmaturia, hæmoptysis, hæmatemesis and melæna, and in the sloughy appearance about the palate and œdema about the conjunctivæ and

eye lids. Finally delirium supervened a short time previous to death, which occurred on the morning of Nov. 13th, eleven days after the first spots had been noticed about the ankles and seven days after the occurrence of nasal hæmorrhage and admission to the hospital.

The treatment consists in large doses of fluid extract of ergot at first and then the B. P. solution of chloride of lime. These measures did not seem to influence the hæmorrhages in any way.

The clinical points which present chief interest in this case are :

1. The extreme severity of the disease.
2. The febrile temperature.
3. The similarity of the clinical picture to one of an acute infection.

The severity of the case is manifest in the degree of prostration and the early fatal termination, for, from the loss of good health till the time of his death, but eight days elapsed.

Of the whole temperature course we are not able to speak positively but its range was from 99° to 104° and when admitted on the first day of mucous membrane hæmorrhages it was found as high as 102.4°. Such a temperature, while it may suggest the presence of some specific fever, may certainly be accounted for by the course of purpura hæmorrhagica alone. But apart from the temperature curve we wish to observe that here the primary event was the *occurrence of hæmorrhages*, spontaneous hæmorrhage as already recorded, being first observed about the ankles and right elbow, the young man meanwhile going about without feeling weakness or illness. Then the constitutional symptoms supervened, fever, prostration, delirium.

The striking similarity that such forms of purpura hæmorrhagica bear to that of an acute infectious process has been long since recognised and numerous clinical observers have commented upon it while pathologists have investigated several cases with this thought before them. There is this, however, to be noted, as is well known, that in infectious fevers and exanthemata proper the appearance of the characteristic eruption follows rather than precedes the febrile and constitutional symptoms.

In this case the autopsy was made within 10 hours after death. The body presented the general appearances of death. An extensive purpuric eruption was observed with large areas of subcutaneous hæmorrhages looking like bruises. Some of these measured from 11 c. m., to 17 c. m., in length, while others were about the size of a ten cent piece. There were no ringed spots. The petechiae bore no special relation to the hair follicles.

The head was not examined. The heart showed numerous small ecchymotic areas as well on the visceral as on the parietal pericardium,

while fresh blood-stained fluid to the amount of 30 c. c. was found in the pericardium.

The vessels on the surface of the heart were injected with air, giving the ventricle a peculiar glistening appearance. There appeared to be some interstitial emphysema as well. The right auricle especially was distended with gas. The right ventricle was flabby and somewhat dilated. The left ventricular muscle showed areas of necrosis and subendocardial hæmorrhages were observed. The aorta was small and relatively thin. The valves were normal while the great vessels showed mixed clots which were frothy.

The lungs presented sub-pleural ecchymoses, both recent and old with several interstitial hæmorrhages. The vessels of the lungs contain air mixed with blood.

But little gas escaped on opening the abdomen. The intestines were greatly distended with gas. The mesentery of the lower part of the ileum contained a hæmorrhagic area. In the gastric mucosa numerous hæmorrhages were seen while the contents of the stomach were bile- and blood-stained.

The duodenum was intensely injected and the rugae swollen, the remaining portion of the small intestine presenting an appearance much the same. Peyer's patches showed no changes.

In the lower part of the ileum a few patches of congestion were seen with one large area about 7 c. m. long covered by a false membrane with ecchymoses both within and about it. This area corresponds to the area of ecchymosis noticed on the peritoneal surface in the mesentery, as above described.

The cæcum and transverse colon were greatly congested. In this part as well as in the rest of the colon were extensive submucous ecchymoses. The contents of this viscus were blood-stained and of the consistence of porridge. The rectum presented submucous hæmorrhages.

The liver floated easily in water; it was friable in places, emphysematous and somewhat spongy at parts. The surface was smooth except where air bullæ were plainly visible. The gall-bladder contained thick black bile.

The spleen was small, dry and flabby. Air was seen within the vessels and it floated just beneath the water surface. The pancreas was congested though not visibly hæmorrhagic.

The suprarenals were of fair size with softened medulla.

The left kidney sank slowly in water. Its parenchyma was somewhat degenerated. There were a few sub-capsular ecchymoses. The right kidney floated. In this organ more degeneration was seen and

the hæmorrhagic areas were more numerous. The bladder contained some frothy urine. There were seen numerous submucous hæmorrhages. The walls were thin.

Coverslip preparations made from the blood in the inferior vena cava showed the presence of enormous numbers of a large encapsulated bacillus undistinguishable from the Bac. aërogenes capsulatus, which seemed to be in pure culture.

Cultures were made at the time of the autopsy from the various organs. From the blood deep lactose agar cultures showed gas formations at the end of 36 hours and the presence of the B. aërogenes capsulatus. Smear cultures on agar of heart, spleen, kidney and liver gave the staphylococcus pyogenes aureus, while cultures from the spleen gave a bacillus smaller than the colon bacillus, whose length was generally about four times its breadth but presenting considerable variability, sometimes appearing as a small diplo-bacillus. Sections of the various organs showed abundant collections of the B. aërogenes capsulatus. In the kidney and liver rarer minute bacilli, corresponding to that isolated from the spleen, were to be recognised. A pure culture of this small bacillus injected into the rabbit (1 cm. intravenously) led to death in 14 days. For several days previously the animal was noticed to be becoming more and more emaciated; then paresis set in, beginning in the hind limbs and becoming general. Already by the fifth day the hind limbs could not be used. During the last twenty-four hours the animal showed fairly frequent convulsions. Pure cultures from the peritoneal cavity of the rabbit into a white mouse (0·25 cm.) led to death of the animal in forty-eight hours. However, neither in the rabbit nor in the mouse were there any ecchymoses or signs of a purpuric condition.

Conclusions:—1. From the history and the course of the case it is hardly possible that the bacillus ærogenes capsulatus was the primary infection.

2. It is quite possible that the staphylococcus pyogenes aureus was primary. There is no conclusive evidence of such however, since examination of the tissues showed no large collection of the cocci in any of the organs, nor again were there any typical abscesses anywhere.

On the other hand we know that this form is a frequent inhabitant of the intestines and this, like the bacillus ærogenes capsulatus may invade the tissues from the erosions in the intestinal mucosa.

3. Concerning the third form again nothing definite can be said, for while somewhat similar forms have been described occurring with purpura, inoculations of pure cultures into lower animals in this case,

while leading to their death were entirely unassociated with any evidences of purpura.

While this case is interesting as showing a somewhat unusual complication of acute purpura hæmorrhagica and while so little is known of the ætiology of this form of disease that every case deserves to be placed on record, yet it cannot be said that this careful bacteriological study leads us any further or throws any light on the causation of the condition.

The chief and apparently the oldest area of disturbance internally was the area of diphtheritic inflammation in the ileum. But nevertheless it may be doubted from clinical history whether this was the primary seat of the disease, for the history shows that for two or three days the patient had subcutaneous hæmorrhages with scarcely any disturbance of the general health. Then it was only with the appearance of mucous membrane hæmorrhages that the temperature became elevated and from this point it would appear that the secondary infection may be traced which ended evidently by affording a point of entrance to the bacillus ærogenes capsulatus with the resulting tissue changes in the heart and other organs as above described.

The question whether cases of morbus maculosus are cases of hæmorrhage due to some specific origin is unanswered, and the relation between the various forms of purpura hitherto classified as idiopathic must yet remain in obscurity.

In preparing this report we have been greatly helped by Prof. Adami who furnished us with a report of the autopsy and directed the bacteriological study.

THE TREATMENT OF PUERPERAL INFECTION— PREVENTIVE AND CURATIVE.[1]

BY

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I hope the members present will pardon the selection of a well worn subject, but it was suggested to me by the admission, into the Gynæcological ward of the Montreal General Hospital while under my care, in one week, of three patients suffering from the effects of puerperal infection, and also by one or two papers upon the subject which have recently appeared in the *British Medical Journal*.

Since the discovery by Semmelweiss of Vienna in 1847 that "Puerperal Fever" (as it was then, and still is by some, ambiguously called) was due to infection, physicians have been searching for some method of prevention and cure. Although the world owes him a deep debt of gratitude for leading investigations into the cause of this disease into the proper channel, Semmelweiss suffered the fate of many others of the world's benefactors,—dying unknown and in want. He endeavoured to prevent the infection by the use of chlorine in the form of chlorinated lime for his hands, instruments, etc., as did also Simpson, and it may be interesting to quote from the latter's lectures delivered and published a little later. He divided the treatment into prophylactic and curative, as follows:

"*Prophylactic.*

1. Preparatory dieting, medicine, etc: The use of quinine, arsenic, perchloride of iron, etc.

2. Best possible air and ventilation.

3. Avoidance of contagion and inoculation. Use of chloride of lime, cyanide of potassium, etc., to disinfect the fingers of the *accoucher*.

Curative.

1. Venesection?
2. Leeches.
3. Fomentations.
4. Rapid counter-irritation, as by turpentine or blisters.
5. Enema or purgatives.
6. Opium with calomel.

[1] Read before the Franklin County (Vermont) Medical Society, May 11th, 1897.

7. Ipecacuanha or tartrate of antimony.
8. Turpentine internally.
9. Colchicum, veratrum viride, digitalis, stimulants and tonics.
10. Washing out the uterus."

The above includes the whole lecture upon the treatment, and, as you see, Sir James was decidedly brief.

The use of antiseptics in midwifery was not placed upon a scientific basis until the advent of Lister revolutionised the whole of surgical technique. It is difficult for us to realise the benefits conferred upon humanity by this man, whom the whole medical, and to some extent the lay, world is at the present time deservedly honouring. His name is one well worthy of a foremost place in the list of the greatest benefactors of the human race, and to rank with Galen, Harvey, Jenner, Morton, Simpson, and Pasteur.

In 1870, Bischoff and Stadfeldt began the use of carbolic acid in midwifery, obtaining marvellous results by so doing. Tarnier replaced this by corrosive sublimate in 1881, but its use was not generally adopted by the profession at large until later.

As proof of the use of Listerism in midwifery, allow me to give you a few statistics which are decidedly instructive if somewhat dry.

In the New York Maternity Hospital from 1875-1883, a period previous to the adoption of a strict antiseptic technique, 3,504 women were delivered with a mortality from puerperal septicæmia of 146; in other words 4.17 p. c.; 1 in 24 or 41.66 in 1000. During the last three months of 1883, however, corrosive sublimate was used in 102 confinements without one death from any cause whatever. This is too small a number of births from which to draw any conclusions as the good results may have been more from good luck than good management, but the following results obtained under strict antiseptic principles will negative any such suspicion. From 1884 to 1893, in this same institution, there were 3,789 deliveries, with seven deaths from sepsis, *i.e.*, ·18 p.c. or 1 in 541.28, or 1.84 in 1000, and during the last three years of this period 1,059 confinements occurred without one death from sepsis.

What a difference these figures show! Without antiseptics 41.66 women died from sepsis out of every 1,000 deliveries, while with strict antisepsis the mortality was reduced to 1.84 per 1,000.

The writer of the article from which the above was quoted states that in New York or other large cities 1.12 per cent. or 11.2 women die from puerperal sepsis out of every 1,000 deliveries in private practice, thus showing that it is safer in such cities to be confined in a maternity hospital than in one's own house. It is hardly fair, how-

ever to make any comparison between the results obtained in a well conducted institution, where the patient has everything which can conduce to a safe confinement, with general private practice, as here there must be a large percentage of women confined either by no one at all or else by some ignorant midwife and whose surroundings render antisepsis almost an impossibility. If it occurs among the well-to-do, who can command the services of a skilled *accoucheur*, it is very seldom that it cannot be traced to the carelessness of either the doctor or nurse.

Let us turn, now, for a moment to some English and Canadian statistics. At the London General Lying-in-Hospital, antiseptics were not systematically employed until 1880. For the forty-five years previous to that, 9,606 deliveries took place with 244 deaths from sepsis, *i. e.*, 1 in 39.36 or 25.4 per 1,000. Between 1880 and 1887, carbolic acid, potassium permanganate and corrosive sublimate were successively employed with the result that 2,585 deliveries occurred with but 16 septic deaths, *i. e.*, 1 in 161.56 or 6.14 per 1,000. Corrosive sublimate was the only antiseptic employed from 1884 to 1889, during which time there were 2,150 deliveries with but 9 septic deaths, *i. e.*, 1 in 238.88 or 4.18 per 1,000.

Next, we will take up the city of London Lying-in Hospital. In this institution in the years from 1870 to July 1st, 1886, no antiseptics were used, and the deaths from sepsis varied from 1 in 24 to 1 in 287, and, except in 1879 and 1881, when they were 1 in 287 and 1 in 104½ respectively, the maximum and minimum were 1 in 24 and 1 in 50 ; truly a most appalling record !

Sublimate began to be systematically employed on July 1st, 1886, and during the next 10½ years, *i. e.*, up to Dec. 31st, 1896, there were 4,608 deliveries followed by only 11 deaths from sepsis, *i. e.*, 1 in 419 or 2.387 per 1,000. Of this period, from Jan. 1st, 1892 to Dec. 31st, 1896, there was not one death from sepsis although 2,392 confinements took place, *i. e.*, septic mortality fell from 1 in 24 in 1870 to nil in 1896.

Healthy surroundings, apart from the use of antiseptics, will do but little to stave off this disease, as was shown in the case of the above mentioned hospital, it having been placed in the best sanitary condition possible with almost no effect before strict Listerism was adopted.

While we cannot go back very far in Canada, it may be of interest to note the statistics from the only two provinces from which they were available, *viz.*, Ontario and Quebec.

Ontario, 1894—In the whole province 42,051 deliveries were followed by 19 deaths from sepsis, *i. e.* 1 in 2,213.21 or ·45 per 1,000.

In the City of Toronto, 4,201 deliveries resulted in 3 deaths from sepsis, *i. e.* 1 in 1,400.36 or ·71 per 1,000.

Hamilton had a septic mortality of 1 out of 1,028 deliveries or ·97 per 1,000.

1895—In the whole province, 41,628 deliveries resulted in 22 septic deaths, *i. e.* 1 in 1,892.18 or ·52 per 1,000.

During the same year, Toronto's mortality from sepsis following confinement was 4 in 4,131 births, *i. e.* 1 in 1,032.75 or ·96 per 1,000.

Quebec, 1894—Here the mortality was as follows:

Whole Province—Births 53,495, deaths from sepsis 87, *i. e.* 1 in 614.88 or 1·62 per 1,000,
" Exclusive of the three cities, Montreal, Quebec and Three Rivers.
Births 43,346, deaths from sepsis 49, *i. e.*..... 1 in 884.61 or 1·13 in 1,000.
City of Montreal " " " .....1 in 216.13 or 4·62 in 1,000.
City of Quebec " " " .....1 in 1,583 or ·631 in 1,000.
City of Three Rivers—Births 343, deaths from sepsis 0.

1895.

Whole Province—Births 58,650, deaths from sepsis 168 *i. e.* 1 in 349.10 or 2.86 per 1,000.
" Excluding three cities.
Births 47,247, deaths from sepsis..... .....120 *i. e.* 1 in 393.72 or 2.53 in 1,000.
City of Montreal—Births 8,596, deaths from sepsis. 42 " 1 in 204.63 or 4·88 in 1,000.
City of Quebec " 2,454, " " " 5 " 1 in 490.80 or 2·03 in 1,000.
City of Three Rivers " 353, " " " 1 " ..... or 2·83 in 1,000.

It will be noticed that the city of Montreal has a comparatively high mortality from puerperal sepsis, but that, I think, can be accounted for in two ways.

The system of registration of births is not so complete among those not belonging to the Roman Catholic church, while that of the deaths is the same all through the province, irrespective of religion, so that, while all deaths from puerperal sepsis are recorded, many births, especially among the Protestants, are not, thus giving a higher percentage of deaths to births than actually exists. It follows that in districts containing the largest percentage of Roman Catholics the statistics will be the most accurate. From these facts, it will be seen that Montreal, having a larger percentage of non-Roman Catholic inhabitants than either of the cities of Quebec or Three Rivers or the rest of the province, will record all deaths from puerperal septicæmia while probably more births go unrecorded than elsewhere in the province, thus showing a higher mortality in child-birth than in other districts where births and deaths are equally recorded. Another reason is that many cases which originate in the country districts are sent into the city for treatment at one of the city hospitals. In the "Woman's Hospital," under the care of Prof. H. Reddy, there have been three deaths from puerperal septicæmia in the last

600 odd deliveries. This is a large death-rate, but all three occurred within one week in 1895, and Dr. Reddy thinks that the infection was directly communicated from the first case to the next two, the cubic space in the ward being insufficient.

Notwithstanding the proved efficacy of antiseptics in midwifery, there is little doubt but that they are not as regularly and thoroughly employed as they should be. Some practitioners do actual harm by their antiseptics as they use such weak solutions that they are inefficient, yet they believe so implicitly in them that they neglect the ordinary precautions of cleanliness. I have even heard a man, who was supposed to be a well educated physician, state in a medical society that he was not a great believer in the use of antiseptics during labour; that he very rarely employed them, and that he even did not always take the precaution of washing his hands previous to examining a parturient woman. That man must either be very fortunate or else have an appalling septic mortality. Many say that in the country antiseptics are not so necessary as in town, as the pure country air banishes the risk of infection, but is that really the case? Most emphatically no! It lessens, but by no means banishes the risk. Its effect is negatived to a great extent by the disadvantages under which the country practitioner works. For example, he has just opened an abscess containing very virulent streptococci, is ten miles from home, and is called hurriedly away to attend a woman in her confinement. He has no time to go home and change his coat and shirt, but has to proceed at once, perhaps, to apply forceps. I fear that all the pure country air in existence would not prevent that patient becoming septic unless it was assisted by thorough use of soap and water and antiseptics, although there is no doubt but that it would mitigate the effects of the infection.

It having been proved by both popular and scientific observation that women who are in a good state of health are less liable to suffer or if infected, to die from puerperal infection, it behoves us to get our patient into as good a condition as possible before confinement.

I have endeavoured to show, by the above statistics, both the utility of antiseptics and also the extent to which puerperal septicæmia prevails at the present day, and hope that you all will agree with me that the strictest antisepsis is absolutely necessary in conducting labour and that the death-rate from infection should be still lower than it is.

Let us now consider both what antiseptic to use and how to employ it so as to best prevent the occurrence of puerperal infection. For the purpose of rendering the hands of doctor and nurse aseptic, carbolic

acid (1·40), corrosive sublimate (1-2000), potassium permanganate followed by oxalic acid (saturated solutions of each) and creoline are most often employed and are about equally efficacious, but all must be used thoroughly to be of any service whatever, and that too after well scrubbing the hands and forearms with a nail-brush and soap and water.

Personally, I prefer sublimate as it is very efficacious and convenient, but if you have been attending any septic cases, the potassium permanganate is better and the manner in which it is employed by Professor H. Reddy at the Women's Hospital is very good. The rules, which he advises the *accoucheur*, students and nurses to employ are as follows:

1. Scrub the hands and forearms with salicylic soft soap, nail-brush and water for five minutes by the clock.
2. Soak the hands in a strong solution of potassium permanganate until they are stained a mahogany brown.
3. Decolorise with a solution of oxalic acid.
4. Rinse off the acid in corrosive sublimate solution (1-2000) or creoline.

By careful attention to the above rules, you will render your hands perfectly aseptic, as I have proved upon several occasions by taking cultures from my own hands and those of my assistants before and after using the pot: permanganate, etc. those taken before being invariably septic while those taken after it have been sterile.

No matter what kind of antiseptic one employs, it is absolutely necessary to thoroughly use the nail-brush with soap and hot water as a preliminary, as not only do you remove a certain number of germs thereby but you also soften the skin and give the germicide a much better chance to act upon the deeper layers of the cuticle.

In some cases, the patient will be suffering from some infective discharge, such as gonorrhœa, and where you suspect such to be the case, you will find it to be of service to give a preliminary vaginal douche of sublimate (1-3000) or creolin, but this should be avoided unless there is some special indication for its use, as it removes the vaginal mucus which serves as a lubricant of the passages and also as a germicide.

This latter fact is one of the strongest arguments against the routine use of antiseptic douches after labour, the healthy vaginal discharge being quite capable of overcoming a large number of bacteria. These cannot be removed from the deeper layers of the mucosa by the douche although the natural germicide, i.e. the discharge, is and therefore the patient is deprived of its protecting in-

fluence, thus being much more liable to infection. These remarks only refer to the routine use of the douche.

Where instruments are used, the hand inserted into the uterus or a dead fœtus is present, an intra-uterine douche of sublimate (1-4000) followed by boiled water will usually prevent any septic trouble, but otherwise no vaginal or intra-uterine douche should be given during the puerperium if everything is progressing favourably.

As an additional safeguard, we should, if possible, choose the room in which the patient is to be confined. In addition to its being light and airy, it should be as far off as possible from any water closet and ought not to contain any fixed-in basins, or, if these are present, they ought to be closely covered up, as one can never tell when the traps may become defective. That this is not an imaginary danger is clearly demonstrated in Playfair's "Science and Practice of Midwifery," where cases are quoted of infection by sewer-gas, and diagrams shown illustrating the way in which currents of air conveying infection passed. Cases where the infection has been traced to a defective drain and where recovery has followed the removal of the patient to another house or room, are now and then reported in medical papers.

Having considered the prevention of infection, let us now proceed to the methods employed to cure a case, once infection has occurred.

The number of the methods of treating this malady shows only too clearly that no specific has yet been discovered, not even the much talked of antistreptococcus serum.

One of the most important factors in the question is the early diagnosis of the case. To begin with, in all cases where you have the onset of the symptoms of puerperal septicæmia appearing, the parts should be carefully examined and any lacerations thoroughly cleansed and repaired to prevent further absorption from taking place through them. The interior of the uterus should likewise be carefully examined for the presence of retained products of conception, and, if found, they should be removed. The safest instrument with which to effect the removal is the finger, or, if this fails, the dull wire curette. A sharp curette may be used, but not unless the operator has had a great deal of experience with this instrument, as, unless one is very careful, it is liable to remove uterine substance.

At this point, I hope that I may be permitted to make a short digression from actual treatment in order to urge the importance of not placing too much reliance upon the temperature in diagnosing septic infection, no matter whether it be puerperal or not. The pulse will be found to be a much safer guide, as, while you almost never will see a case of

sepsis without a quickened pulse, you will not rarely run across cases in which there is almost no noticeable rise in temperature, I, myself, having seen several cases in which the temperature did not rise over 99·5° F. Where you have a rapid pulse, headache, foul tongue and a dry, hot skin in a puerperal woman look out for septic infection, no matter what the temperature indicates.

In the majority of cases where the patient developes a slight chill with rapid pulse, and possibly some rise in temperature on the 4th or 5th day after labour, an intra-uterine douche of sublimate (1-3000) will usually rapidly check the process. If the first one does not do so, it is well to repeat it in five or six hours, when thoroughly swabbing out the uterus with either pure carbolic acid or else iodized phenol in addition will often have marvellously beneficial results.

If the case is more severe, especially if the cervix and vagina are covered with false membrane, thorough curettage of the uterus and also even of the vagina is indicated and may require to be repeated as it is exceedingly difficult to get the curette up to the orifices of the Fallopian tubes. For this reason it is well to use a very small curette. This operation ought to be followed by a copious douche (intra-uterine) of sublimate (1-3000), which should be succeeded by one of boiled water, after which, the cavity should be carefully dried and then swabbed out with either pure carbolic acid or iodized phenol.

A word now in regard to sublimate douching. Many are afraid to use it, in case they cause sublimate poisoning. While not denying that this does occasionally occur, especially in blondes, the sublimate douche, when properly given, seldom is followed by any ill results.

Personally, when the intra-uterine douche is indicated, sublimate is what I always employ in a strength of 1-3000 both in public and private, and I have never yet seen any harmful effect follow, but great care is always taken to have a free exit for the fluid from the uterine cavity and the last drops are expelled by expression.

In the City of London Lying-in Hospital, Clement Godson uses sublimate entirely, using 1-1000 for the hands and 1-2000 for vaginal irrigation. He gives a 1-2000 vaginal douche at 115°F., immediately after delivery of the placenta and repeats it three times with an interval of twelve hours between each, after which he replaces the sublimate with iodine. This method has been employed in over 4,500 deliveries without any sign of mercurial poisoning. Another British writer, Sharp, says that, "in a really serious septic case, corrosive sublimate is the only reliable antiseptic and should be used fearlessly in a strength of 1-2000." This, however, I think is too strong a solution,

as such a powerful one would destroy the tissues and so furnish pabulum for the germs.

In addition to local treatment, the patient's general condition will require attention. Her strength must be maintained by nourishing but easily digested food, such as milk, eggs, soups, juice expressed from beef, which has just been warmed through, etc. Stimulants are usually necessary, good brandy, whiskey or port, being the most serviceable of the alcoholic ones and strychnine of the truly medicinal ones, giving gr. $\frac{1}{40}$ - $\frac{1}{30}$ every 4, 6 or 8 hours, as the urgency of the case requires. The spirits may be beaten up with egg and milk once or twice daily, if the patient can stand these latter, in addition to taking them in water at whatever intervals are indicated.

The bowels and other emunctories should be kept active, and hot applications to the abdomen, especially turpentine stupes, are of great service in relieving the pain. For this latter purpose, Battley's solution is very useful, it acting somewhat as a stimulant in addition to its sedative properties.

It is not advisable to give antipyretics continuously, as they simply obscure the symptoms, but eight or ten grains of quinine may be given now and then if the temperature keeps up too high.

Serum therapy in the treatment of puerperal septicæmia has been receiving considerable attention of late and numerous cures by it have been reported, but Marmorek's antistreptococcus serum is still on its trial, and, I fear, will not turn out to be such a success as was at first hoped. In nearly all of the successful cases in which it has been used, the general and local treatment above recorded has been employed, which utterly negatives the results as far as testing the value of the serum is concerned. Certainly a few cases have been reported where its administration has been followed by rapid amelioration of the symptoms, although the older treatment had been thoroughly employed with no effect, so that there is no doubt but that it is sometimes of benefit. It must be remembered, however, that the majority of mild cases, if taken in hand early, get well under intra-uterine douching, and that many of the severer ones can be cured by curetting combined with the application of caustics and douching, while other cases, apparently no more severe, will result fatally, no matter what we do. The dose of the serum varies, rapid improvement having followed the injection of 3 c.cm., while 20 c. cm. have been used in other cases with absolutely no result. The dose ordinarily employed seems to be 10 c. cm. injected under the skin of the abdomen and repeated every six or eight hours, if required. When successful, an almost immediate fall of temperature and pulse

rate follow. The only complication which has been recorded is the occurrence occasionally of a bullous eruption near the seat of injection. Whether one uses the serum or not, it is absolutely necessary that he should not neglect to employ the older treatment in addition.

Personally, I have only used it in two cases and could not see that the slightest benefit resulted. The first case, however, can scarcely be considered to be a fair test, as the patient was first seen in consultation five days after the onset of the symptoms of infection. At this time there was nothing abnormal to be made out in the pelvis or abdomen, the doctor in charge having douched the uterus several times with a solution of 1-4000 of sublimate. Septic pneumonia was present, the base of the left lung being involved. The patient received three injections of 10 c. c.m. each, within thirty-six hours, but died neither the pulse nor temperature being influenced by the serum.

The second patient was brought into the gynæcological ward in the Montreal General Hospital nearly four months ago, signs of infection having shown themselves nearly one week previously. There were some small lacerations of the vagina, this organ, together with the cervix and interior of the uterus being covered by a greyish false membrane, a culture from which gave streptococci. The lacerations were thoroughly cleansed and repaired, the uterus and vagina were curetted, douched with one gallon of sublimate solution (1-3000), well swabbed with pure carbolic acid and lightly packed with iodoform gauze. Douching and packing were repeated twice daily for several days. On the second day, as there was not very marked improvement in the pulse and temperature, an injection of 10 c. c.m. of antistreptococcus serum was administered and, in order to be brief I will just say, was repeated every twelve hours during the next six days, 20 instead of 10 c. c.m. being twice given. After a day or two the temperature and pulse rate began to come down and would fall to nearly normal and then shoot up again during the night to between 102 and 103° F. The serum was discontinued and the temperature has continued to rise and fall almost daily ever since, but latterly it has remained down for perhaps two continuous days under the influence of five grains of quinine. Two abscesses, probably pyæmic, have developed in one arm and the left hip-joint appears to be affected. The patient's strength is keeping up well and she is slowly recovering.

From an analysis of the cases fully reported where it has been employed, the serum appears to give excellent results where cultures prove the presence of streptococci alone, but, where the infection is mixed, it is of but little use.

As regards operations for relief of the condition, I may say that curetting is the only one to be recommended although of course abscesses which develop should be opened. When a case is sufficiently severe to indicate hysterectomy, it is too late to operate, and, as so many cases get well after less heroic methods of treatment, I don't think that we are justified in removing the uterus, which in itself is a grave undertaking. If, however, you find that the uterus is greatly lacerated, inviting the absorption of infection as it were, the question of hysterectomy may be considered.

RETROSPECT

OF

CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Gastroptosis.

Dr. Leop Kuttner, of Berlin, and Dr. Dyer, of Portland, Maine. "Ueber Gastroptose."—*Berliner Klinische Wochenschrift*, Nos. 20, 21, 21, 1897.

Within the past few years much has been written on displacements of abdominal viscera, and abnormal positions of the same but perhaps not the least interest gathers about that displacement known by the name gastroptosis and the frequently associated condition of nephroptosis. While the writings of Glenard, Meinert, Hertz and others discuss the condition, etiology, and symptoms pretty thoroughly, there remain many points yet unsettled. The object of these observers whose article is now under review, is to present the results of observations made in the polyclinic of the Augusta Hospital, in Berlin, on numerous cases which were examined as well as to give a glance over the literature on this subject.

We regret that tabulated statements are not offered as summaries of these observations.

Touching the question of etiology they remark that no cases of congenital gastroptosis have been observed.

It appears that gastroptosis not only belongs to later life but that it develops gradually.

Theoretically, first, the stomach may be pressed down, *i. e.*, by corsets, waist bands, etc., by a low standing diaphragm, by pleurisy etc., and in the second place it may be pulled or dragged down.

It appears that the second method of displacement is the more common, this depending much upon the condition of the wall itself. Atonicity may induce such displacement according to Kussmaul, here quoted, by leading to a certain degree of stagnation of food, especially

in the pyloric end and thus this may act as a weight to drag the other portion of the organ downwards, hence displacement—gastroptosis.

The "individual differences," of tone may account somewhat for degrees of displacement. So frequently was movable kidney associated with a displaced stomach that these observers were almost decided in the view that even if not demonstrable, some degree of gastroptosis existed. Though it may be granted that a predisposition existed in such cases of ptosis of abdominal organs yet it seems that the *applied* causes are sufficient to produce the changes in position noted in a few cases at least.

A quotation from Stiller is added to strengthen the view that a predisposition exists in very many cases. Stiller has observed in many of these patients, subjects of enteroptosis, that the 10th rib is a free or floating rib, as the 11th and 12th are. By this, when discovered, he is led to suspect enteroptosis. In such cases, too, pronounced neurasthenia has been almost invariably observed.

Kuttner and Dyer have corroborated such observations in many instances. The etiological factors as sex, age, habit of dressing, pregnancies are in accord with those of other writers.

In 42 cases showing gastroptosis in females fifteen times the right kidney alone was dislocated, while in fifteen cases both were found displaced. The liver was found displaced in ten instances, the spleen in but four of the cases observed. In men and boys where the stomach was found displaced there was no demonstrable kidney, liver or splenic displacement. The symptoms when present are various and variable and therefore not characteristic. The appetite sometimes fails and then again is insatiable. There may be much epigastric distress and this in proportion to the amount of food taken. Constipation is common.

Kuttner and Dyer strongly urge that while muscular atony may be produced by gastroptosis such an atonic condition of muscles is in a large number of the cases preceded by the displacement of organs.

The function of gastric secretion may also be disturbed, giving rise to hyperacidity, subacidity or even achlorhydria.

The general nervous manifestations, as weakness, changed voice, dizziness, cold hands and feet, palpitation and restless sleep are common in such cases and doubtless bear a direct relation to the intestinal condition. How often a high degree of nervousness is associated with constipation and only relieved when this condition is properly and effectually treated!

Meinert's view of the relationship of chlorosis and gastroptosis in young girls is not accepted by these authors.

In 15 chlorotic girls only 6 showed any signs of gastric displacement. They would explain the frequency of association by saying that the chlorotic condition led to gastroptosis, most likely through atony of the muscle.

There seems to be no *immediate* relationship between gastroptosis and the condition of the blood as some have taught. Observations were made on 19 cases in which there was no displacement and 19 in which displacement was demonstrable, the ages corresponding pretty closely and no marked differences were discovered.

Whether the altered position of the stomach or associated condition of nutrition is the cause of any lowered hæmoglobin quantity is not decided.

In ascertaining the position of the stomach these observers have great faith in the evidence obtained by *percussion*. They recognize however, that great care is needed to eliminate errors. Gastrodiaphany is highly recommended.

When by percussion it is impossible to locate the stomach it may be distended by means of air pumped in. This method is preferable to that in which tartaric acid and sodium bicarbonate are used.

Under differential diagnosis nothing is added of special moment.

The treatment of gastroptosis consists in measures which prevent atonicity in abdominal muscles and downward pressure on the stomach. These refer to dress and care of patient during and after pregnancy. The bowels are to be kept free, the muscles may be toned up by massage, cold applications, faradism.

Secondly, the treatment of the condition itself. The wearing of a well fitted abdominal band is strongly recommended. Thus an artificial abdominal covering is made which helps to keep the organs in place by increasing the abdominal pressure.

Rest in bed for two or three weeks may be found advantageous and thereafter such cases are helped by rest in bed two hours after food-taking.

Medicinally strychnine is perhaps the best drug as it increases muscular tone. The bowels should be carefully regulated.

W. F. Hamilton.

Pathology.

UNDER THE CHARGE OF J. G. ADAMI.

The Definition of Inflammation.

KANTHACK, A. A. "Pathological Jottings. V. *Acute Inflammation.*" —*St. Bartholomew's Hospital Journal*, April, 1897.

In the April number of a bright and varied periodical, the *St. Bartholomew's Hospital Journal*, my old friend and colleague, Dr, A. A. Kanthack, criticised at some little length my views upon acute inflammation, published in the first volume of Allbutt's System of Medicine. I must freely acknowledge the force of several of his arguments : indeed it was with very considerable diffidence that I ventured to pass beyond the old and time-honoured statements which, until now, have served as definitions. Could I have recognised that the reaction to injury in vascular and non-vascular tissues respectively differed in kind, and not merely in degree, I would gladly have continued to regard inflammation as a process essentially confined to vascular tissues. But this is not the case. The essential processes occurring in regions rich in vessels and those devoid of them are the same in nature. There is no line of demarcation between them, aud this being the case, wishing, as a general pathologist, to establish myself upon broad principles, I could—and still can—see nothing but harm in raising what is, after all, but an arbitrary distinction and one devoid of any true inwardness, between two phases of one condition and in teaching that the processes which follow injury to a non-vascular part are to be considered vague and to remain unclassified, while the same processes, modified merely, as I say, in extent and not in kind, are, so soon as they occur in a vascular area, to be considered inflammatory and all important. To the ordinary practitioner the distinction is, I admit, most convenient, but for the pathologist striving, as he ought to strive, to pass beyond the surface of things and to grasp at the principles which govern morbid processes, the distinction is, I must contend, valueless. It may be convenient to separate the "reaction to injury" in non-vascular regions from the reaction to injury in voscular areas ; indeed, could any one find an appropriate and acceptable terminology, I would gladly speak of "reaction to injury" (or attempt at repair) in general, and subdivide this into (1) the processes occurring in non-vascular animals and tissues, and (2) those seen

in tissues provided with vessels, and to this latter class alone apply the term inflammation. But, unfortunately, we do not possess the requisite terminology, hence when it became a question between convenience and philology on the one hand, and convenience and the broad principles of our science on the other, I was forced to give up the idea of inflammation which Dr. Kanthack would retain—for we as teachers of pathology should, above all things, be ministers, not of the letter, but of the spirit. Otherwise we fall into that same pit in which Dr. Kanthack would leave us to continue to flounder—of seeing in inflammation a process "*sui generis*" which is not to be elucidated by studies upon lower forms of life, which is so marvellously complex that observations upon the actions of leucocytes and the properties of individual cells of various tissues should not be invoked to clear our conceptions of the same. "To select phagocytosis or chemiotaxis or new formation and repair as essentials, and make them the corner stones of theories of inflammation which are rendered more attractive by an appeal to comparative anatomy and evolution is unjustifiable; phagocytosis, chemiotaxis and proliferation are concomitant, or it may be constant phenomena of acute inflammation, and each of them by itself can readily be traced back from the highest to the lowest forms of animals, but surely it is not sound reasoning to evolve the whole process of inflammation from one or two of its phenomena, especially where such phenomena are extremely primitive protoplasmic properties. Evolution may teach us how a property or a character has been acquired, it may tell us something of the philogenetic origin of an organ or a process; but it does not pretend to assert that a complex process in a higher animal type which perfectly or imperfectly can be traced back to some property or function in a low animal type is identical with this property or function. . . . . *Without a blood vascular system inflammation is impossible.*" This it seems to me is the gist of Dr. Kanthack's criticism.

I know my old friend well enough to be assured that the 'suggestio falsi' of this passage is wholly unintentional and but a matter of 'trop de zèle.' Nay, in all probability I wrong him in supposing that it is applied directly to me and my article. Nevertheless, reading the criticism as a whole it would seem directed entirely against my teaching, and as a consequence I am bound to protest that it does not place that teaching in a right light. For in the first place I have not selected phagocytosis or chemiotaxis, or new formation and repair as essentials. What I attempted was—accepting with some reservation, that definition which for thirty and more years has been most widely accepted among English speaking people (namely Burdon-Sander-

son's)—to collect together all the observations bearing upon this subject. I attempted to bring these together in an orderly fashion, beginning with the lowest forms and advancing to the highest." In the second part of my essay I discussed all the phenomena recognized as being associated with the process of inflammation, the vascular changes, the part played by the leucocytes, the exudation, the nervous system, &c., the relationship of fibrosis to inflammation, and then, and only then, when I had marshalled all the facts, did I venture to give the definition to which a consideration of all these facts seemed to lead, namely, that inflammation (the reaction to injury) is *the local attempt at repair of actual or referred injury.* This surely is not selecting one or other process as the corner stone of my theory, nor is it evolving "the whole process of inflammation from one or two of its phenomena." And here let me in parenthesis state that Dr. Kanthack in more than one place would seem to wish to confuse 'attempt at repair' with 'repair.' They are no more to be interchanged than are 'war' and 'victory.'

That it is wrong to approach this subject from a comparative pathological aspect, Dr. Kanthack, pupil as he is of the founder of 'cellular pathology' cannot seriously propound. It is quite true that evolution does not pretend to assert that a complete *process* in a high animal type is identical with some one *property* or function in a low animal type. But no one has made this assertion. On the other hand if the endeavour be made to analyse the various factors which can be distinguished as playing some part in the complex process in the high animal type, and if by studying each separate factor it is seen to be in evidence more or less distinctly in a chain of lower animal types; or, contrariwise, if we can see that each factor acting in the lower acts also in the higher animal, then it is not illogical to group the simpler processses occurring in the lower and the more complex in the higher, into one common class.

If Dr. Kanthack's argument be correct then we must no longer venture to class together the gradual disappearance of the particle of food in the food vacuole of an amœba and the complex processes which result in the assimilation of a human dinner under the common term of 'digestion.' I am inclined to employ the retort malicious and turn upon Dr. Kanthack's his own aphorism: "It is unsafe to be too philosophical."

As to the postulate that without a blood vascular system inflammation is impossible, let me repeat that the more I have studied, the less have I been able to recognise any essential difference between the processes which follow injury in a non-vascular and in a vascular area

respectively. The main results gained by the presence of vessels in a part seems to be this, that by their intermediation the reaction to injury is more prompt and more extensive, there is more rapid conveyance, to the injured area, of substances, cellular and otherwise which tend to counteract the irritant, more rapid removal of the irritant and of the products of its action ; but this is merely an augmentation not an alteration of the means employed by the organism. The vessels and the vascular changes are seen to be adjuvant, not the essential features in the progress.

Dr. Kanthack, it is true, states that he is able to recognise a difference in kind between what occurs in (non-vascular) cartilage and in vascular tissues when these are injured. Were this so he would be possessed of the strongest argument in favour of his contention. But wherein the difference lies he does not say, and until he states clearly what fundamental peculiarities are to be made out in the behaviour of damaged cartilage, I can neither criticise, nor can I accept his contention.

While I urge these objections to Dr. Kanthack's polemic, I trust that I shall not be taken for one of those foolish individuals who, having at one period of their lives assumed a definite position, ever after, either from obstinacy or from an absurd sense of personal dignity, feel bound to defend the same blindly. I am very far from being unprepared to recognise defects in the definition I have given, for, with Dr. Kanthack, I acknowledge freely that to define inflammation is almost an impossibility. Vital processess, like "life" itself, evade definition. We can at most approximate to such, and that approximation must be accepted as best which is most helpful to an intimate comprehension of the process. Just as physiology may be defined as a study of the functions of the organisation in health, so is pathology a study of the functions in disease. There may be wide variations in those functions compatible with perfect health, wide variations, within physiological limits, of the various factors upon the interaction of which depends the due working of the different organs and tissues. But let any one factor be varied beyond a certain point, and the imperceptible limit between health and disease is passed. It is this same fact that renders it impossible, or almost impossible, to define health and disease; there is no set boundary between the two conditions. Thus to employ two somewhat unfortunate examples brought up by Dr. Kanthack against me: "If," says he, "we take Professor Adami literally, the constant renewal of the cuticle would be inflammation." This would be quite true if we did not all, in considering these matters, tacitly admit and leave out of account physio-

logical injury. The shedding of the cuticular epithelium is a physiological process. Neglecting for the moment the fact that physiologically it is only dead cuticle that is shed and that has to be renewed, and that it is peculiarly difficult to see where the injury comes in, and where, consequently, my definition is at fault, let us take it for granted that this renewal of the cuticle is the result of injury; then we must admit also that we pass by imperceptible gradations from such physiological casting off and renewal of the cuticle to the most intense dermatitis produced by agents whose power of inflicting injury we cannot fail to distinguish.

There is, and there can be, no absolute dividing lines between the processes constituting the renewal of physiological tissue waste, and the processes constituting inflammation, whether we limit this last term to processes occurring in vascular tissues or no. To this extent it is impossible to define inflammation. We thus—all of us—for the purposes of definition are led to assume, or imply, an imaginary boundary.

Or to quote Dr. Kanthack again "During lactation the cells lining the mammary alveoli are constantly losing part of their substance, but they immediately regain that loss. Is that inflammation?" Certainly it is not: we are attempting to define a pathological process and all employing our definition will tacitly leave out of the category of injuries, processes which all recognize as perfectly normal. What is normal cannot be satisfactorily classed as an injury. All the same while we do not admit that such cases can reasonably be said to be included in a definition which states that inflammation is the local attempt at repair after *injury*, actual or referred, the fact remains that alteration and destruction of cells occurring in the functional mammary gland is not to be distinguished from what is seen to occur in the gland which is the seat of injury, and while we do not consider the former class of cases to be reasonably or justly covered by my definition, I and all will admit that a careful study of these and similar examples of the physiological 'process of repair' is most valuable nay, necessary, in adding to our comprehension of the changes, cellular and otherwise, which manifest themselves in the pathological 'attempt at repair.'

The nearest approach to a definition given by Dr. Kanthack is that inflammation will be regarded as "a series of changes occurring only in vascular or vascularisable connective tissue, or in connective tissue which is in easy communication with the surrounding blood vessels" (as the result of injury actual or referred?) From this it will be seen that he considers it impossible to have inflammation of mucous or

epithelial surfaces or membranes. Here again I cannot follow him. I fail to see that any conceivable good is gained by narrowing our conception of the process so as to include connective tissues alone. The series of changes occurring in vascular and vascularisable connective tissues is alone to be termed inflammation. The like series occurring in non-vascularisable connective tissues is to be nameless, the like series in mucous membranes and epithelium is to be nameless. *Cui bono?*

The only ray of hope left visible in Dr. Kanthack's dangerous condition is this, that he is inevitably and implicitly led to acknowledge in the diagram with which he concludes his article that the proliferative processes, occurring in connective tissue cells as the result of acute inflammation—tend toward repair.

J. George Adami.

Canadian Medical Literature.

UNDER THE CHARGE OF KENNETH CAMERON.

[The editors will be glad to receive any reprints, monographs, etc., by Canadian writers, on medical or allied subjects (including Canadian work published in other countries) for notice in this department of the JOURNAL. Such reprints should preferably be addressed to Dr. Kenneth Cameron 903 Dorchester street, Montreal.]

PERIODICALS.

MAY, 1897.

CANADA MEDICAL RECORD.

Notes on varicocele cirsocele : its pathology, clinical history and treatment—Thos. H. Manley, New York, p. 389.

Shock after abdominal operations and how to prevent it—A. L. Smith, Montreal, p. 393.

JUNE, 1897.

LA CLINIQUE.

No original article.

JULY, 1897.

THE CANADIAN PRACTITIONER.

Hyperchlorhydria—H. J. Hamilton, Toronto, p. 470.

A case of intra-laryngeal mycosis—Price-Brown, Toronto, p. 482.

A cent in a child's œsophagus for nearly two months ; skiagraph ; recovery—E. E. King: Toronto, p. 505.

Three cases of poisoning by methyl blue—A. J. Harrington, Toronto, p. 506.

Bromoform anæsthesia—J. W. Smuck, Toronto, p. 507.

THE CANADA LANCET.

Antitoxine in the treatment of laryngeal diphtheria—Dillon Brown, New York, p. 531.

THE CANADIAN MEDICAL REVIEW.

Viburnum in abortion—Wm. Graham, Toronto, p. 1.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Difficult labours—D. G. Fleming, Chatham, Ont., p. 481.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Anti-streptococic serum—W. J. Wilson, Toronto, p. 1.

Case of poisoning by corrosive sublimate—A. J. Harrington, Toronto, p. 4.

Address in Medicine. By Prof. Austin Flint. Delivered at the Semi-Centennial of the American Medical Association, Philadelphia, June, 1897, p. 6.

THE MARITIME MEDICAL NEWS.

The relative value of excision and arthrectomy of the knee, with a report of four cases of excision—N. E. McKay, Halifax, p. 225.

L'UNION MÉDICALE DU CANADA.

De l'épilepsie jacksonnienne—Observations préliminaires sur les localisations cérébrales motrices—Etude clinique d'une cas de cette varieté d'épilepsie compliquée de paralysie athrophique de la jambe et traitée avec succés par l'électricité—D. Brochu, Québec, p. 385.

Quelques notes sur un case de mortalité assez ètrange à la suite d'une injection de serum antidiphthérique Roux—P. V. Faucher. Québec, p. 404.

La Revue Médicale..

De l'intervention electro-thérapeutique dans le traitement de l'occlusion intestinale aigue—M. D. Brochu, Québec, p 1.

REPORTS, ETC.

Transactions of the Canadian Medical Association, Twenty-ninth Annual Meeting, Montreal, August 26th, 27th and 28th, 1896.

La Revue Medicale.

The old city of Quebec has now come forward as an aspirant for journalistic honors in medicine, by the appearance, in the French language, of *La Revue Médicale.* The editor is Dr. P. P. Boulanger, and is assisted by Drs. Ahern, Brochu, Simard, Vallée and others. They believe that although there are two journals in the province published in French, there is plenty of room for further work, and propose to produce, at a small cost, not only original articles, but the more important contributions which appear in the periodicals of Europe. The *Revue* presents two novel features in Canadian journalism. The form in which it appears is modelled after that so familiar among the majority of the journals of France, and it will further follow the custom of that country by appearing weekly. There must be plenty of good material to work upon in Quebec, and the editors deserve encouragement in their new and rather ambitious undertaking.

Kenneth Cameron.

Reviews and Notices of Books.

The Disorders of Digestion in Infancy and Childhood. By W. Soltau Fenwick, M.D., B.S., Lond., M.R.C.P. With Illustrations. London: H. K. Lewis. 1897.

This is an eminently practical manual on the subject of dyspepsia in children, compiled chiefly from the notes of some five thousand cases of disordered digestion which have come under his notice at the Evelina Hospital and elsewhere. The work opens with chapters on the physiology of digestion in early life, and a statement of the important facts which should regulate the diet and hygiene of infancy; chapters in which we note a full recognition of the value of the recent work in this department of American specialists. After speaking of the dyspeptic conditions met with in infancy, there follows an excellent chapter on acute gastro-intestinal catarrh in infants. Referring to the treatment of this troublesome affection the author says, "The vomiting and diarrhœa which usually accompany the early stages of the complaint are of distinct value to the organism; they constitute, in fact, the first line of defense devised by nature against noxious materials, which find an entrance to the body through the digestive canal; and it is only when they persist after their work has been completed that they prove a curse rather than a blessing. The first indication, therefore, is to assist the alimentary canal to rid itself of those elements of danger which it contains. In infants the first attack of vomiting generally empties the stomach so that there is seldom any need for the employment of an emetic. Nevertheless if the breath smells sour, and masses of curd or fermenting food continue to be rejected, a full dose of ipecac or sulphate of zinc may be given. The presence in the stools of undigested food, of yeast like material or of small lumps of fæcal matter, indicates that the intestines still contain the sources of irritation, and means should be taken to secure their expulsion. For this purpose he recommends a full dose of castor oil, followed up by the use for a day or two of a castor oil mixture, combined at the same time with abstention from food. Afterwards the author endeavours to promote asepticity of the digestive tract. The drugs he specially recommends for this purpose are calomel in small doses from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain, the solution of the perchloride of mercury, and resorcine. In the later stages he advises a combination of subnitrate of bismuth, in full doses combined with resorcine. Opium should be given in symptoms of collapse, and to relieve excessive pain and tenderness.

The chapters on digestive disorders in older children are very interesting and instructive, the whole subject being treated in a very thoughtful manner. We have much pleasure in recommending this work

strongly, especially to the young practitioner who often may find himself at a loss to know just how to treat these very troublesome affections of early life. A. D. B.

A Manual of Materia Medica and Pharmacology, comprising all Organic and Inorganic Drugs which are and have been official in the United States Pharmacopeia; together with important allied species and useful synthetics. By David M. R. Culbreth, Ph.G., M.D., with 450 illustrations. Lea Brothers & Co., Philadelphia and New Y o 1896.

This very excellent work on Materia Medica has been written with the view of supplying a text-book not only adapted to the needs of students in Colleges of Pharmacy, but also serviceable to the practical pharmacist, supplying the information necessary for the higher branches of his business. The work opens with an excellent introductory chapter giving definitions of terms and explaining the various modes of administration of remedies, with a brief note on the conditions which may modify their action. The drugs obtained from the vegetable kingdom are arranged and described in their natural orders, according to the classification of Bentham and Hooker. Animal drugs are also treated in the natural historic relationship of the animals from which obtained. Inorganic drugs are described according to their chemical relationship. Three additional chapters follow. One on the official organic carbon compounds. A second on the non-official organic carbon compounds, in which the chemistry of the open and closed chain compounds is explained. A short chapter on the Microscope and its use in Pharmacy closes the work. Of the many references we have made to this work all have been particularly satisfactory. One of its features deserving special commendation are the very numerous wood-cuts. Almost every plant is illustrated, some of the more important having several excellent illustrations. While a considerable amount of the information contained in this work cannot at the present day be considered as actually necessary for the medical student, to those who have time and inclination no study can be more interesting. It is to the students in pharmacy, however, that we would specially commend this volume, believing that it will fully supply all the requirements necessary in a text-book. A. D. B.

A Manual of Infectious Diseases. By E. W. Goodall, M.D., Lond., and J. W. Washbourn, M.D., London. 8vo. pp. 360. London. H. K. Lewis. 1896.

This book has been designed chiefly for the use of students, and treats of the specific fevers common to England and to this country. Much attention has been paid to diagnosis and treatment. Special chapters are devoted to the discussion of Fever, Contagion, and Disinfection, and owing to the frequent mistakes made in Diagnosis, a brief account of "Sore Throat" and of the rashes simulating those of the specific fevers is given.

A notable feature of the work is the diagrammatic representation of the distribution of the various rashes on the body. Photographs of the various micro-organisms at present recognised as the cause of disease are given. The temperature charts are numerous. We have much pleasure in recommending this work to both students and practitioners. The opportunities for students of the present day acquainting themselves thoroughly with infectious diseases must necessarily be very limited. The advantage of possessing a clearly written and well illustrated work on the subject is therefore manifest. A. D. B.

Artificial Anæsthesia. A Manual of Anæsthetic Agents and their Employment in the Treatment of Disease. By LAURENCE TURNBULL, M.D., Ph.G. Fourth Edition. Revised and enlarged. With illustrations. Philadelphia. T. Blakiston, Son & Co. 1896.

This very excellent Manual on Anæsthesia and Anæsthetics reached its fourth edition on the fiftieth anniversary of the discovery and introduction of ether. The whole subject is thoroughly handled and well illustrated. No physician is justified in administering anæsthetics without thoroughly acquainting himself with the dangers connected with that state and the best means of avoiding or combatting them should they arise. We have much pleasure in recommending this manual as one which will supply all desirable information in a clear and happily expressed way. A. D. B.

Braithwaite's Retrospect of Medicine. A half-yearly journal containing a retrospective view of every discovery and practical improvement in the medical sciences. Edited by JAMES BRAITHWAITE, M.D., Lond., assisted by E. F. TREVELYAN, M.D., Lond., M.R.C.P.

This work still commands our admiration. To most of our readers Braithwaite's retrospect is a household word, and is associated with their earliest recollections of medical literature. Although of such venerable memory, the retrospect still maintains its excellence. The present volume contains the usual careful selection of the most interesting papers culled from medical literature of all nations. We are glad to notice that Canadian authors are well represented. A. D. B.

The Year-Book of Treatment for 1897. A Critical Review for Practitioners of Medicine and Surgery. Crown octavo, 488 pages. Philadelphia and New York. Lea Brothers & Co., 1897.

This excellent review, written almost entirely by English authors, and republished by Lea Brothers & Co., fills an important niche on our shelf. The present issue fully maintains the reputation which the book has won for itself as a carefully executed sifting of the work done in the practical departments of medicine in the course of the past year. Although occupying a comparatively small compass, careful examination shows how excellently the work has been done. No important acquisition to our knowledge is omitted. A. D. B.

Teratogenesis ; An Inquiry into the Causes of Monstrosities. By J. W. Ballantyne, M.D., F.R.C.P.E., F.R.S.E. Oliver & Boyd, Edinburgh, 1897. Pp. 62.

This little volume contains three essays which were originally intended to form the first part of a work on monstrosities, and deal with the Theories of the Past, as to the causation of monstrosities. These are divided into supernatural causes, physical causes and mental influence. The original intention of the author to publish a subsequent part dealing with the modern theories has been altered, and the Theories of the Present will be incorporated in his work on Diseases and Deformities of the Fœtus. The facts appear to be thought of less importance and receive scant attention.

The fact that the contents of the present volume consist for the most part of imperfectly digested nonsense is due to the subject matter under consideration and to circumstances beyond the control of the author. That he appears to have escaped almost unscathed, and able to say in conclusion, "that the cases which have been advanced to prove the potency of maternal impressions have been accidental coincidences, and not the effects of their alleged causes," is a matter for congratulation. We quite agree with him that one case in a hundred presents phenomena which it is very difficult entirely to explain away, and that the mental condition of the mother during pregnancy may produce miscarriage or lead through general nutritive or vascular disturbances to irregularities in embryogenesis.

The case, however, where the circumstances of a mother having been impressed by the sight of a hair-lip is considered by Dr. Ballantyne to have some possible connection with the presence of a naevus on the child's neck at birth, is not, necessarily "far worthier of record than are those in which an impression is said to reproduce itself as regards form and situation on the infant's body."

It appears to disregard the main question as to whether the date of the impression is such as would make it possible for an adequate change in nutrition to have occurred at all. Thus the causes underlying a defective closure of the spinal canal must be operative, at the latest, prior to the sixth week of gestation, and probably before the woman was aware of the fact of her pregnancy. Whereas most of the recorded cases concern impressions imparted at a time too late to have any connection with the anomaly, and Dr. Ballantyne has not taken pains to state, in the cases quoted by him, whether this objection existed or not.

It is to be regretted that the collaboration of some pathologist has not been secured in connection with the large and valuable material collected in connection with the author's work on Diseases and Deformities of the Fœtus. About the former little is known, and all are anxious to learn. About the latter we have rather too much information of a certain sort.

Inaccurate pathology is responsible for much of what is strange in teratology. J.

T. G. RODDICK, M.D.

HENRY BARNES, M.D.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI. AUGUST, 1897. NO. 2.

BRITISH MEDICAL ASSOCIATION.

MONTREAL MEETING.

We have received from the Local Secretaries the following detail notes with reference to the forthcoming meeting, bearing more especially upon the attendance of members of the Association, upon hotel and lodging accommodation in Montreal, on reduced railway rates and the means of obtaining the same, and in brief upon all those matters in which it is well those who propose attending should be posted before their arrival in Montreal.

ATTENDANCE AT THE MEETING.

All those intending to be present at the Meeting of the British Medical Association upon August 31st, and the following days must be members of the Association or invited guests of the same.

MEMBERSHIP.

Membership in the Association is to be obtained upon terms which can be obtained from the Secretaries of the Branches throughout Canada.

These applications can be made to Dr. J. A. Springle, Montreal; Dr. G. C. Jones, Halifax; Dr. W. B. Thistle, Toronto; Dr. E. Crompton, Victoria; Dr. J. R. Jones, Winnipeg; Dr. C. P. Dewar, Ottawa; and Dr. A. Marois, Quebec; who are Secretaries of the various Canadian Branches.

The subscription to the Association is $5.00 per annum together with an additional small sum for membership of the Branch, varying in the different Branches.

It is open to Members of the Profession to join on or after July 1st, and to pay the half subscription for the half year. Members receive a copy of the British Medical Journal weekly.

While it is possible for Members of the Profession who are British subjects to be elected Members of the Association at the time of the Meeting it is most desirable that as few as possible seek election by this means. Election in Montreal will be by the General Council of the Association. At least twenty-four hours must elapse between arrival in Montreal and election, during which period the intending member will have no privileges, while in addition each application will place an extra amount of work upon officials who will at that time probably have more than they can comfortably accomplish.

So as to add to the success of the Meeting and to the proper entertainment of each individual Member, the Local Executive begs that all those who propose attending will immediately forward their names to the Hon. Secretaries (at 2204 St. Catherine St., Montreal.)

Transport.

Canadian Members.

Members and their wives and children are given the privilege of travelling to Montreal for one half of one single first class fare, or one first class fare for the round trip. This advantage may be secured by the following methods :—

1. By buying a single first class ticket to Montreal for each traveller and obtaining a certificate from the ticket agent, at the point of departure, stating that such purchase has been made. Any ticket agent will furnish such certificate on request. On presentation of this certificate at the Reception Rooms in Montreal, a free pass will be given for the return journey over the same line.

2. By obtaining a certificate from the Secretary of the Excursion Committee (Dr. H. S. Birkett, 2204 St. Catherine St., Montreal) and upon presentation of the same at any ticket office of any Canadian Railway, the agent will sell bearer a ticket at the above reduced rates. In writing for the above certificate Members are requested to give name in full as also the full name of wife and child. Each individual requires a special certificate.

Children from five to twelve years of age will be charged half adult rates.

These privileges apply to Canadian Railways only and are good from July 1st, to Sept. 30th, 1897.

Guests of the Association.

The same privileges as are accorded to Members in the matter of Transport and Excursion in Canada will also be afforded to the invited guests of the Association.

Guests of the Association from points in the United States, east of

the Mississippi River, can secure round trip tickets to Montreal for one single first class fare and one-third.

To obtain this rate it is necessary to purchase at point of departure a single first class ticket to Montreal, at the same time securing from ticket agent a certificate stating that said purchase has been made, then upon presentation of such certificate to the Secretary of the Association in Montreal, a return ticket will be issued over the same line at one-third first class fare from August 27th to Sept. 7th inclusive.

This arrangement holds good only for those arriving in Montreal on or after August 28th, and leaving Montreal not later than September 7th.

Delegates to the Meeting.

The National and State Medical Societies of the United States have been invited to be represented, each by one delegate.

These delegates are requested to be present at the opening meeting, at which special seats will be reserved for them, in order that they be personally introduced to the President and to the Association.

Excursions.

These same privileges, namely, of obtaining a ticket for a single journey at one half a first class fare and a return journey at a single fare applies equally to excursions taken by Members and their families up to Sept. 30th, 1897.

It is to be noted that what is here stated concerning the railways on the St. Lawrence River applies also to many of the steamboat lines.—Niagara Falls Line, SS. Empress of India, Muskoka & G. B., Nav. Co., Bay of Quinte Ry. & Nav. Co. We would especially call attention to the fact that the Canadian Pacific Railway offers free passes over all their branch lines in Manitoba, North-West Territories and British Columbia, and for all their steamboat lines in the Canadian North-West to all Members and guests of the Association who purchase tickets to Vancouver, B. C., and return. The fare for this trip is $70.45. Members desiring to visit any point in Canada either before or after the meeting, from now until Sept. 30th, are privileged to obtain the above rates. Pullman and parlour cars are attached to each train.

We here note in somewhat fuller detail the excursions which may well be made and the approximate cost of the same.

The old city of Quebec, is one hundred and seventy-two miles from Montreal ; fare, $3.50. A very pleasant day can be spent in the old city visiting the different points of interest. From Quebec one can

go down the St. Lawrence and up the Saguenay, thence to Lake St. John. Here there is a comfortable hostlery known as the Hotel Roberval, and good Ouananiche fishing can be obtained in Lake St. John. Boats and guides are always to be had. From Lake St. John to Quebec, one can go by rail ; distance, one hundred and ninety miles.

Montreal to Halifax, Nova Scotia, distance, seven hundred and fifty-six miles ; single first-class fare, $16.50. From Halifax one can visit the Annapolis Valley, and the Bras d'Or Lakes. There are two main lines of railroad leading from Montreal to Halifax passing through picturesque and fertile country.

Montreal to St. John, New Brunswick ; distance, four hundred and eighty-one miles ; cost, $14.15, single fare first-class.

Montreal to Ottawa ; distance, one hundred and twenty miles ; single first-class fare, $3.50. The Parliament Buildings in Ottawa are very handsome, and well-worth seeing.

A very pleasant trip would be from Montreal to Kingston by rail and down the St. Lawrence through the Thousand Islands by steamer. Montreal to Kingston, one hundred and seventy-five miles ; first-class single fare, $5.65.

Montreal to Toronto, three hundred and thirty-three miles, single first-class fare, $10.40. Toronto is a very convenient point from which to visit the Falls of Niagara ; distance, sixty miles from Toronto. A very pleasant trip would be from Montreal to Toronto by rail, from Toronto to Niagara and back to Montreal through the Thousand Islands and the different Rapids of the St. Lawrence by steamer.

Western trip, Montreal to Vancouver ; distance, two thousand and nine hundred and ninety miles ; time, five and a half days. The cost of a return ticket to members of the British Medical Association : first-class, $70.45, instead of the usual rate of $135.10. The sleeping cars cost each way $20.00 for double berth. Meals in dining cars and restaurants, 75 cents each. This is a trip which we would advise all members and guests who can afford the time to take, as it will give them an impression of the vastness and resources of British North America that can be obtained in no other way. The trip is not tedious and every day is thoroughly enjoyable. The cars are comfortable, the scenery constantly changing, and of very great interest. Stop-over privileges are allowed at all points, from some of which interesting side trips can be made. From Rat Portage, the new gold fields of the Lake of the Woods, Rainy Lake and Seine River can be reached by steamer. The Canadian Pacific Railway have kindly offered to give to each member and guest of the Association going to Vancouver over their line, free passes over all their branch railway

and steamboat lines in Manitoba, the Canadian Northwest Territories and British Columbia, thus enabling those who desire to visit Rossland and other points of interest an opportunity to do so. Those who intend to take this trip are asked to apply early so that date and accommodation may be provided. By the payment of an extra $5.00 members may return by the Great Northern or Northern Pacific. In this way the Yellowstone Park may be visited. The Yellowstone Park is a National United States reservation and requires five days to see it all. The expenses of the trip through the Park are not included in the railway fares. Members desiring to visit the Yellowstone disembark at Livingston on the Northern Pacific Railway. The trips from Livingston through the Yellowstone and return are as follows : Livingston to Mammoth Hot Springs and return, including transportation only, $5.00 ; second, Livingston to Cinabar by rail thence by stage to the Mammoth Hot Springs, Norris, Lower and Upper Geyser Basins, Yellowstone Lake, Grand Cañon, and Falls of the Yellowstone, returning by the same route, including transportation and five and a half days board at the Park Association Hotels, $49.50. The date for closing the Park is October 1st. No charge will be made for passengers returning viâ Portal and the Soo Pacific route to St. Paul, thence to Sault St. Marie where the Canadian Pacific is again reached.

For those members who prefer to go from Owen Sound to Fort William through Lakes Huron and Superior by the Canadian Pacific steamers instead of north of Lake Superior by rail, an extra charge of $4.25 each way is made, which includes berths and meals. These steamers are large steel boats with all the comforts of ocean steamships. Members are recommended to go one way by these steamers.

This trip across the great prairies and the Canadian wheat fields will be at the time when the wheat is about ripe, and harvesting will be in progress. The scenery through the great lakes and the Rockies outrivals that of Switzerland. Banff Hotel and the Banff Hot Springs, four thousand five hundred feet high, are in the National Park. The great Glacier is said to contain more ice than all the Swiss Glaciers put together. The scenery along the Fraser River is of the wildest and most fascinating character.

The hotels at Banff, at Glacier, and at several other points, where members might care to stop, are thoroughly comfortable in every respect.

Accommodation in Montreal.

Montreal is well supplied with hotels and lodging accommodation and is thoroughly prepared for receiving the Association and its

guests, but inasmuch as the meeting takes place at a time when there is a large influx of ordinary travellers into Montreal, and a liability for the best accommodation to be rapidly taken up, it is well that those intending to be present at the meeting secure their rooms beforehand, and we must strongly advise all such to communicate immediately with Dr. R. F. Ruttan, Secretary of the Reception Committee, 2204 St. Catherine street. Should, however, any member or guest fail to take this most advisable step, it is to be noted that the Reception Room at McGill University will be open from 9 a.m. upon Monday, August 30th, and those desirous will be able to obtain there full information concerning lodging and hotel accommodation.

Hotel Accommodation.

By writing in advance, hotel accommodation can be secured at the following rates :

Windsor Hotel—Room with bath, $4.00 to $5.00 ; without bath, $3.50 to $4.00.

St. Lawrence Hall—Room with bath, $3.00 to $4.00 ; without, $3.00.

Balmoral Hotel—Rooms, $2.50 to $3.00.

Queen's Hotel—Rooms, $2.50 to $3.00.

Richelieu Hotel—$2.50.

Turkish Bath Hotel—Room for single person, $1.75 to $2.75 ; double bedded rooms, $1.50 to $2.00 per person per diem ; the bath rooms of the hotel and swimming baths are free.

Avenue Hotel—Single person, $1.50 to $2.00 ; double bedded rooms, $1.50 to $1.75 per person per diem. (These last two named are Temperance Hotels.)

All these prices are upon the American plan and include meals as well as lodgings.

Lodgings.

In the neighbourhood of McGill College there are very numerous boarding and lodging houses where rooms and breakfast may be obtained at moderate rates, These vary from 75 cts. to $1.50 per person per diem, and in most cases breakfast can be obtained but no other meal. The list of the lodging houses recommended by the Reception Committee can be obtained on application to Dr. Ruttan, or preferably, if those writing will state the nature of the accommodation wanted, the Reception Committee will allot the best rooms available at a given price in order of priority.

Meals.

The Local Executive will provide an excellent lunch in the Drawing rooms of the Engineering Building, supplied by the best caterer in Montreal, at the rate of 50 cents per head. Tickets admitting to

luncheon will be procurable at the Reception Room and at the door of the McDonald Engineering Building. This lunch will be of several courses: and the price paid will include lemonade, tea, coffee, etc. Beer and light wines will be obtainable and will be charged extra. It is proposed that at an extra charge of $1.00 per party, special tables can be secured in advance in a separate room, so that members and guests can form special parties, the extra charge will be for special service, etc. Apart from this there are numerous cafés situated on St. Catherine street, half-way between McGill College, where the morning meeting will be held, and the Windsor Hall where the general addresses will be given in the afternoon. The prices at these cafés are in general very moderate.

The Arrangements for the Meeting.

Following upon precedent, the business of the meeting will consist of the work of the eleven sections, which will take place in the morning from 9.30 to 1, and the general meetings for the conduct of business and to hear general addresses in the afternoon. The Sectional meetings will take place in the various lecture theatres and halls in connection with McGill University, the business and general addresses will be conducted in the Windsor Hall upon Dominion Square each afternoon from 2.30 or 3.00 until 4.00 or 4.30. Local excursions and entertainments after 4 o'clock each afternoon. There will be each day a series of short excursions, receptions and garden parties ; for each of these a limited number of tickets will be distributed. Among the more important of these may be mentioned Miss Roddick's reception at the Art Gallery on Tuesday, the 31st, a garden party at the Royal Victoria Hospital and the excursion by steamer down the river on Wednesday, the International Golf Match at Dixie, the excursion round the mountain and several garden parties on Thursday. The excursion down the Lachine Rapids and the laying of the foundation stone of the New Nurses Home at the General Hospital (it is to be hoped by Lord Lister) upon Friday.

Similarly each evening there will be one or more entertainments beginning with a smoking concert at the Masonic Hall on the Monday evening and including a reception at Laval University, reception by Sir Donald Smith, at 1157 Dorchester St., and a reception and evening garden party at McGill College on Friday evening.

Upon Saturday, Sept. 4th, several excursions may be taken. A party of from three to four hundred will be entertained by the Mayor and Corporation of Ottawa, and there will be a large excursion open not only to members and guests but also to their friends, to Lake Memphremagog.

Upon Thursday, Sept. 2nd, the Mayor and Corporation of Montreal have invited the Association and its guests to a lunch upon the Mountain.

Arrangements for Ladies Accompanying Members.

Members, as it has been already stated, can obtain for their wives or daughters travelling with them, the same privileges with regard to travelling and excursions as are granted to members themselves. The garden parties and other receptions save in exceptional cases are open to the ladies accompanying the members and guests as well as to the members and guests themselves. One of these exceptions is the Annual Dinner. The receptions at Sir Donald A. Smith's and at the Laval and McGill Universities are for members and the ladies accompanying them. A Ladies Committee has been called together and is actively at work making arrangements for the ladies present at the meeting, more especially during the mornings when members and guests are engaged in the work of the various sections. The Redpath Library at McGill, a very beautiful building, will be set apart especially for their convenience, and here arrangements are being made to hold a general concert upon at least one morning. Also afternoon teas will be provided and ladies wishing to hold afternoon tea parties for their friends, can, upon application obtain comfortable private rooms. A matron will be placed in charge of the rooms set apart for these various purposes at the Redpath Library.

Reception Rooms.

A large tent and an extensive suite of rooms have been set apart in the Arts Building at McGill to form the Reception Rooms. Here members and guests must register and obtain their cards admitting them to the various sections and meetings, and here will be also post, telegraph and telephone offices, counters for the distribution of tickets and invitation cards for the various entertainments, cloak rooms, office for sale of railroad and steamboat tickets, smoking and retiring rooms, etc., etc. Here also will be distributed each morning the daily programme.

Contributions to the Business of the Meeting.

It is open to all members and indeed all guests of the Association, to offer papers to be read in the various sections, but owing to a large amount of time taken up by the various discussions, it is probable that in several sections some at least of the papers though accepted by the committee in charge of the work of those sections, will have to be read by title, although subsequently they can be published in full

in the Journal of the Association (*British Medical Journal*). It is especially desirable that Canadian work be well represented.

Papers read before the Association must not exceed 15 minutes in delivery. When accepted they become the property of the Association and must be published in the first place in the *British Medical Journal*. Those desirous of communicating papers are requested to notify the local Secretaries of the various sections of their desire and the title of their paper as soon as possible. The list of those local Secretaries with their addresses will be found in any recent number of the *British Medical Journal*, where also will be found a programme of the work so far arranged in the various sections.

The Annual Museum.

A leading feature of the coming Meeting will be the exhibition of medical and surgical apparatus, prepared foods, drugs, books, etc., in fact, of all that is of special interest to the medical man. This exhibition is an annual event in connection with the Meetings of the British Medical Association, but never before, not even at the London Meeting, will there have been so extensive and well-arranged an "Annual Museum." The Museum Committee under the Chairmanship of Dr. Perrigo has worked indefatigably, with the result that the spacious Victoria Skating Rink situated in the immediate neighbourhood of the Windsor Hall will be filled with interesting and important exhibits shown by the leading firms in this country, the States, Great Britain and by some of the best known firms in France and Germany. This will be open throughout the Meeting from 9 a.m. until 6.30 p.m. each day. Admission will be reserved until 3 o'clock each day for members of the medical profession, after that it will be open to the general public also.

Notice to Exhibitors.

The same facilities for transport and travelling throughout Canada will be afforded to exhibitors as are granted to members and guests of the Association. The only additional requirement is that they present a certificate from Dr. James M. Jack, (Secy. of the Museum Committee) when they apply in Montreal to obtain these privileges.

Transport of Exhibits.

Nearly all the railroad companies in Canada and east of the Mississippi are granting passes permitting the free return transport of exhibits. Full information with regard to these privileges can be obtained on writing to Dr. James M. Jack, (2204 St. Catherine St., Montreal).

Annual Pathological and Physiological Museum.

It is hoped that as many as possible will, without delay, indicate their intention of contributing specimens, (Anatomical, Physiological and Pathological), apparatus, photographs of rare or well-marked conditions of disease, teaching models, etc., to the Annual Pathological Museum. These exhibits will be collected together in the large and well-lighted Pathological Laboratory at McGill College. It is especially intended to make an extensive exhibition of photographs and microphotographs. Those prepared to contribute to this department of the Annual Museum are requested to write immediately to Dr. C. F. Martin, McGill College, giving the names and a short description of the specimens they exhibit, for insertion in the Museum Catalogue.

PRELIMINARY PROGRAMME.

(Subject to Alteration.)

For the Week Beginning Monday, August 30th.

Monday, August 30th.

Afternoon—Meeting of the Canadian Medical Association and Address of the President, Dr. V. H. Moore, Brockville, Ont.

Evening—9.00 Smoking Concert at the Masonic Hall.

Tuesday, August 31st.

Morning—9.30 Meeting of the Canadian Medical Association at the Synod Hall (to discuss the subject of Interprovincial Registration of the Medical profession in Canada).

11.00 Opening Service of the British Medical Association at the English Cathedral.

Afternoon—2.30 Opening ceremonies at the Windsor Hall and address by the President.

5.00 Afternoon tea and reception at the Art Gallery by Miss Roddick.

9.30 Reception and Conversazione at Laval University; Address by Professor Charles Richet, Official Delegate of the French Government.

Wednesday, September 1st.

Morning—9.30 to 1.00 Sectional Meetings (11 in number) in the various lecture theatres at McGill College, Presbyterian and Diocesan Colleges, etc.

Afternoon—3.00 Address in Medicine at the Windsor Hall by Dr. Wm. Osler, of Baltimore.

4.15 Excursion to Lachine by special train and down the Lachine Rapids by the steel steamer "Sovereign": Garden Party in the grounds of the Royal Victoria Hospital.

Evening—9.00 Reception at 1157 Dorchester street by Sir Donald A. Smith, G.C.M.G.

Thursday, Sept. 2nd.

Morning—Sectional Meetings.

Afternoon—1.00 Lunch upon the Mountain given to the Association and its guests by the Mayor and Corporation of Montreal.

3.00 Address in Surgery by Mitchell Banks, Esq., F.R.C.S., of Liverpool.

4.00 International Golf Match and Reception at the Montreal Golf Club at Dixie. Garden parties, Afternoon teas, &c.

4.30 Excursion round the Mountain, afternoon tea at the Kennels (Montreal Hunt Club) at Outremont.

Evening—7.45 Annual Dinner of the Association at the Windsor Hotel.

Friday, Sept. 3rd.

Morning—Sectional Meetings, McGill College.

Afternoon—3.00 Address in Public Medicine at the Windsor Hall, by Dr. Herman Biggs, of New York. Concluding business of the Meeting.

4.15 Excursion to Lachine, Lake St. Louis, and down the Lachine Rapids.

Evening—6.45 Dinner given to Lord Lister and presentation of address by the Montreal Medico-Chirurgical Society.

9,00 Presentation of Honorary Degrees at McGill University, followed by a Conversazione in the University Buildings and grounds.

Saturday, Sept. 4th.

Excursions to Ottawa, Lake Memphremagog, etc., etc.

CANADIAN MEDICAL ASSOCIATION.

The Canadian Medical Association will hold its Thirtieth Annual Meeting at Montreal, on Monday and Tuesday, Aug. 30th and 31st, 1897.

The following programme has been arranged:

MONDAY, August 30th, 1897.

1 p.m.—Clinical Demonstration. Montreal General Hospital.

3 p.m.—General Session. (Synod Hall, No. 75 University St., cor. Burnside)

Address by Chairman of Local Committee.

The Reception of Visitors.

Election of Members.

Notices of Motion:

(1.) That the number comprising the Nominating Committee be increased

from 10 (as formerly decided by By-law) to 15, the latter permitting of a more general representation. T. G. RODDICK, Montreal.

(2.) That the By-law relating to the Nominating Committee be amended to read: "That the Nominating Committee be elected by the Association, on the 1st day of each annual meeting by ballot after nomination." R. W. POWELL, Ottawa.

4 p.m.—President's Address. V. H. MOORE, Brockville, Ont.

4.30 p.m.—Address by W. WATSON CHEYNE, London, Eng.

Appointing of Nominating Committee.

Appointing of other Committees.

General Business.

8 p.m.—Smoking Concert in Windsor Hall.*

TUESDAY, August 31st.

9.30 a.m.—General Session. Synod Hall.

Report of Committee on Inter-Provincial Registration.

Report of Nominating Committee.

Reports of other Committees.

General Business.

For further particulars Address F. N. G. STARR, 471 College Street, Toronto.

* It is desired that a large number will be present, to extend a fraternal welcome to visitors from abroad.

There are still a few copies of the "Transactions" of the Canadian Medical Association for 1896, on hand. It is a volume of 194 pages. A copy will be mailed to you upon the receipt of the price, $1.00.

F. N. G. STARR, *General Secretary.*

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.—Meeting at Louisville, October 5, 6, 7, 8, 1897. The Railroads will make a round-trip rate of one and a-third fare, or probably one fare. The address on Surgery will be delivered by Dr. J. B. Murphy, Chicago; the address on Medicine by Dr. John V. Shoemaker, Philadelphia. Titles of papers should be sent to Dr. H W. Loeb, Secretary, St. Louis, Me.

NEW BOOKS, ETC., RECEIVED AND NOTED.

Text-book of Diseases of Women. By Chas. B. Penrose, M.D., Ph.D. W. B. Saunders, Philadelphia, 1897.

The Roller Bandage. By Wm. Barton Hopkins, M.D. 4th edition. J. P. Lippincott Company, Philadelphia, 1897.

American System of Practical Medicine. Edited by Alfred L. Loomis, M.D., LL.D., and Wm. Gilman Thompson, M.D. Vol. 2. Lea Bros., Philadelphia.

Notes on Malaria in connection with Meteorological Conditions at Sierra Leone. By Surg.-Major E. M. Wilson, C.M.G. H. K. Lewis, London. 1897.

Spontaneous Rupture of the Aorta exclusive of Ruptured Aneurisms. By Delano Ames, A.B., M.D., and W. Guy Townsend, M.D. Reprint from Maryland Medical Journal, July 3rd and 10th, 1897.

The Position or Posture of the Patient during Parturition with special Reference to the Walcher Position. By A. F. Currier, M.D. Reprint from the Medical News, March 7th, 1896.

Ventral Hernia resulting after Abdominal Section, and its Treatment. By Andrew F. Currier, M.D. Reprint from Annals of Gynæcology and Pediatry, July, Vol. X., Boston.

THE
MONTREAL MEDICAL JOURNAL.

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Original Communications.

THE PRESIDENT'S ADDRESS.[1]

BY

THOMAS G. RODDICK, M.D.

You have been welcomed to the Dominion of Canada by the Noble Earl who is the worthy representative of our beloved Queen; you have been welcomed to the Province of Quebec, to which this city belongs, by our eloquent and justly-esteemed Lieutenant-Governor; the Chief Magistrate of our city has given you "*Caed mille failthe*" in a manner in which only an Irishman with such a great sympathetic heart as he possesses can give; and now I rise to welcome you on behalf of the medical profession in Canada, and to thank you for the honour conferred on this city and country by your presence here to-day. Would that I could find suitable language in which to thank you also for the high honour you have done me in electing me to preside at this great meeting of the British Medical Association, an honour which is appreciated none the less by the consciousness that it is not a personal matter but a compliment to Canadian medicine.

This meeting of the British Medical Association in Canada is an event which will serve still more to impress upon the memory of our people the year 1897, the year of the Diamond Jubilee of our beloved Sovereign, Queen Victoria. In no part of her vast Empire—not even in its very heart—did her subjects celebrate the great event with more enthusiastic loyalty and devotion than in Canada, especially in this province, the home of the French-Canadians. We Canadians of both tongues love and honour our Queen. Long may she live! Deeply, too, have we appreciated here the splendid reception accorded in the old home to our Premier, the Right Hon. Sir Wilfred Laurier, whose distinguished bearing and grace of manner

[1] Delivered at the meeting of the British Medical Association, August, 31st 1897.

eminently fitted him for the important part it was his peculiar privilege to play in the magnificent ceremonies of the Jubilee. A French-Canadian, Sir Wilfred's presence in England as the chosen representative of the Dominion was an object lesson to the Empire and to the world in the harmony existing between the two nationalities which comprise the Canadian people.

And here let me express on behalf of every representative from the British Isles, and on behalf of every Canadian present, the genuine pleasure we feel in having among us on this memorable occasion so many of our brethren from the United States. This only proves the cosmopolitan character of our profession; this is only another recognition of the unity of medicine. Legislators may squabble, the air may be filled with wild alarms, and war may appear imminent day by day, but our relations are not disturbed in the slightest degree; our interests are common—we are kinsmen in science; we go forward hand in hand, irrespective of race or creed or colour, having one intent only: the advancement of our noble profession, and through that the amelioration of the ills of mankind.

It is my privilege also to welcome the representative of another Republic, La Belle France, to whose gifted men of science our profession is so greatly indebted. This gentleman, who bears the credentials of his Government, and officially represents the great nation of which he is so bright an ornament, is known far and wide as the Professor of Physiology in the University of France, Dr. Charles Richet. In coming to Canada it cannot be said, nor will he feel, that he comes to a foreign country, for in the Province of Quebec he will find another France, with a delightful mingling of the old and the new: his own beautiful language spoken with all the grace and purity of the old *régime*.

But we are further honoured by the presence among us to-day of the most illustrious surgeon of our generation, Lord Lister, who stands for the rise and zenith of modern surgery. It has been well and truly said that as long as surgery is scientifically discussed Lord Lister's name cannot fail to be mentioned. We have only to compare the surgery of the time before 1873 with the surgery as practised to-day to appreciate all that he has done for the science. Can it be for a moment questioned that Lord Lister has made operative proceedings possible which only twenty-five years ago would have been considered criminal? Undoubtedly, the most powerful agency in the development of surgery in this century has been the introduction of the antiseptic and aseptic methods of wound treatment which he initiated. It is due to his efforts that surgical wards have been freed

from pyæmia, and the mortality of lying-in hospitals reduced to the limits of normal parturition. For the past twenty years honours many and great have been showered upon him. Oxford, Cambridge, Edinburgh, Glasgow, Dublin, Toronto, and now McGill, have vied with one another in hastening to do him homage. Our Sovereign in conferring upon him the richly deserved distinctions which he bears with such gracious dignity only gives expression to the general feeling of his countrymen throughout the Empire and his admirers the world over. We are glad, I say, to have him with us to-day: his presence is an intellectual stimulus and an energizing force in our deliberations.

It is, I understand, an unwritten law of the Association that the President shall not in his address encroach upon the topics which belong by right and usage to the readers of the main addresses and to the presidents of the various sections. I have observed that the majority of my predecessors have contented themselves with discoursing on objects and circumstances of local interest: they describe the town or city in which the meeting is held, or perhaps they discuss questions of a public character. In the absence of an address on public medicine, others have taken that for their theme. It has been my unhappy lot to select and consider subjects only to find in quick succession that they had already been appropriated, either by the Journal of the Association, in describing so fully Montreal and its surroundings; or by the editors of the Official Guide or Souvenir, who have given a very comprehensive description of Canada; or by some of the gentlemen who preside over the sections, who, I have been led to understand, purpose discussing questions of medical education. I fear therefore that what I have to say this afternoon will fall far short of the brilliant presidential addresses which members of this association have been accustomed to in other years. Indeed when I look at the long roll of eminent men who have been my predecessors in this high office—men oftentimes distinguished for their literary gifts as well as for their exalted position in the medical world—I confess that I marvel at my temerity in accepting so great a responsibility. In speaking of my predecessors allow me especially to refer to the retiring President, Dr. Henry Barnes, whose courteous and kindly manners, together with his sterling ability, makes us all glad to know that his election as a Vice-President for life insures his continued official and active connection with the Association. Here might I also be permitted to say how greatly I appreciated the many kindnesses and courtesies extended to me by the President (Dr. Saundby) and Members of the Council when in London last winter, making the initial arrangements for this meeting.

With respect to the other addresses, which it is customary to deliver on these occasions, medicine will be dealt with by one whose reputation is now world-wide—by our Osler—whose professional education was in great part received in this city, and who, I am happy to say, is still a Canadian. How he has been able to escape the alien law is a puzzle to many ; but he has really only been borrowed for a time ; he is merely passing through the United States in bond. We are only waiting until we can find a place large enough to hold him, when we shall coax him back. Sorry am I that his old colleagues in his own department of medicine, Howard and Ross and Macdonnell, are not here to share with us the genuine pleasure we experience in finding him in the position which he occupies to-day. One of these, the late lamented Howard, had much to do with moulding his career and setting him to the task which he has so ably accomplished.

You will hear addresses in Surgery and Public Medicine, delivered by gentlemen who have devoted their lives to their special subjects.

Before proceeding further, however, allow me, for the benefit of those who may not be acquainted with the work of the British Medical Association, to give in as few words as possible a general idea of its organization.

The British Medical Association.

When, in 1832, Sir Charles Hastings, of Worcester, communicated to a few of his personal friends the idea he had conceived of a medical association which should bring the whole provincial profession of England into a common brotherhood, it may be safely affirmed that he did not dream that he was laying the foundation of an association which would ultimately not only embrace the whole of the British Isles, but extend to that Greater Britain beyond the seas, and become an association of imperial magnitude and of imperial importance and significance. I have no hesitation in expressing my belief that the British Medical Association will be an important factor in bringing to a successful issue that great scheme of Imperial Federation which now exercises the minds, and, let me add, the hearts, of the leading statesmen of the Empire. Sir Charles Hastings' aim was to bring town into professional union with town, county with county ; now it has become the aim of the Society he called into being to add State to State—and may I not say continent to continent ?—until all the nations and peoples who live under the British flag are brought within the beneficent influence of the Association.

With respect to the objects of the Association, as set forth on its foundation, they may briefly be stated to be:

1st. The collection of speculative and practical information through essays, hospital reports, infirmaries, dispensaries, or private practice.

2nd. Increase of knowledge of the medical topography of England through statistical, meteorological, geological, and botanical inquiries; the investigation of the modification of endemic and epidemic diseases in different situations and at various periods, so as to trace, as far as the recent state of the art would permit, their connection with peculiarities of soil and climate or with the localities, habits, and occupations of the people.

4th. The advancement of medico-legal science through succinct reports of cases occurring in courts of judicature.

5th. The maintenance of the honour and respectability of the profession generally in the provinces by promoting friendly intercourse and free communication of its members and by establishing among them the harmony and good feeling which ought ever to characterise a liberal profession.

During its earliest years the movements and proceedings of the Association were quiet and unostentatious, the meetings simple in their arrangements; but it was not long before medical societies began to join the newer body, and towns in all parts of the Kingdom soon came to regard it as an honour to entertain the Association. Gradually the best men of each district enrolled their names, and the membership increased so greatly that subdivisions into branches became a necessity. Each branch, with its own ordinary and annual meetings, was practically a replica of the parent society, possessing its own president, vice-president, secretary, treasurer, council, and by-laws, subject to the approval of the Council of the Association, to which, besides, each branch sent representatives according to its numerical strength. In 1837, five years after the foundation of the Association, there were three of these branches formed, namely, the East Anglian, the Bath and Bristol, and the Lancashire and Cheshire. By the end of 1878 the Association had spread over the whole United Kingdom, the total number of branches at that date being 30—one of the 30, it is interesting to note, being Jamaica, the first Colonial branch to be formed. It was organized in 1878. Two years later we find that Australia appears for the first time, contributing three branches to the Association. Since then 36 more branches have been added, making a grand total of 65, with a collective membership of over 17 000. Of the branches 27 are Indian and Colonial. Doubtless before long those portions of Africa which are

now becoming rapidly civilized will also add their quota, so that it is possible that within the lifetime of all present the British Medical Association will be represented wherever the British flag flies. As Nova Scotia is always to the fore in matters intellectual, it is not surprising that the first Canadian branch of the Association should have been formed in Halifax. It was started in 1887, four years ahead of Montreal, Toronto, Manitoba, and British Columbia. Canada has now seven branches, the Ottawa and Quebec branches having been formed within the last year. The formation of the Manitoba, Toronto, and Montreal branches was the immediate result of the visit to this country of Mr. Ernest Hart. In 1891, Mr. Hart, who has been editor of the *British Medical Journal* since 1867, passed through Canada and addressed *en route* the members of the profession in Winnipeg, Toronto, and Montreal. Of the Manitoba branch, which began with 25 members, Dr. Ferguson was nominated as president, and Drs. Thornton and Lamont as vice-presidents. In Toronto the branch also began with 25 members, Dr. Macallum being nominated president, and Dr. Thistle honorary secretary. In Montreal the meeting was largely representative in spite of the short notice given, and 26 members of the profession at once signed applications for membership. The officers nominated were: President, Dr. (now Sir William) Hingston; first vice-president, the late Dr. George Ross; second vice-president, Dr. Jas. Perrigo. The members of the Council were: Drs. Roddick, F. W. Campbell, and Geo. Wilkins. In the course of a very happy speech made on this occasion by Mr. Hart he remarked that he looked forward to the time when the Canadian membership would be large enough to invite the Association to hold a meeting in Canada; and he hoped that the first meeting held outside the limits of the British Isles might be held in this country. Little did we think at the time that Mr. Hart's hopes would be so quickly realized. But the idea has ever been present with us, and those who subsequently attended meetings of the British Medical Association in England have lost no opportunity of advocating the claims of Canada, and especially of this the metropolitan city of Canada, as a place of meeting for the Association.

One of the secrets of success of the British Medical Association is that it makes no distinction in the treatment of its members. Colonial members have all the privileges of the British members, and are always warmly welcomed at the headquarters in the Strand, and at the annual meetings. The Association has a large reserve fund of £40,000 sterling, which is the joint property of the members, to be

used for public and professional purposes, and any suitable applications for grants for medical research, whether from British or Colonial members, always receive attention.

A gentleman to whom the Association is greatly indebted is Mr. Francis Fowke, who was appointed Secretary and General Manager in 1872. At that time the Association was in rather a precarious condition financially, owing to its deficient organization; but shortly after Mr. Fowke took up the reins of office matters were found steadily to improve. About the time he was appointed the subscriptions amounted to £4,677. Ten years later they had nearly doubled, the amount being £9,147; and in 1891 they had reached the very respectable sum of £14,759. It is interesting to note how closely the advertisements in the *Journal* kept pace with the increase in membership. In 1871 the amount received for advertisements was £1,992; in 1881, £6,089, and in 1891, £14,568. The head office, which had been in Birmingham, was moved to London in 1872, where, after two removals, the present commodious premises in the Strand were taken. In 1879 the Association began the printing as well as the publishing of its *Journal*. The library, which now contains 10,000 volumes, and which includes nearly every modern medical work of note, and many valuable books of reference, has developed in that time. That the British Medical Association is the largest and most influential guild in the world cannot be questioned. Moreover the good it accomplishes increases from year to year, and more than keeps pace with the expansion of the Association. Imagine the mighty power of the collective action of 17,000 earnest men pitted against false dogmas and ever battling for the truth! It is not, however, by the greatness of numbers that the Association will be judged —it is by the diversity and quality of results. It is impossible to imagine any combination of circumstances which would render this great Association any less necessary or useful than it is to-day. It will undoubtedly continue to grow in numbers, to increase in importance, and to be ever more and more an influence making for the amelioration and elevation of mankind.

The Canadian people, and especially the citizens of Montreal, are highly flattered and gratified that Canada should be the first country without the United Kingdom to be honoured by a meeting of the British Medical Association; and while they hope that it will not be long before the honour is repeated, our people are not insensible to the claims of other portions of the Empire, more especially the great island continent of the antipodes, Australia. Either Sydney or Melbourne would be a fit meeting place for such an imperial organization

as this, and should the next meeting which is held outside the British Isles be held under the Southern Cross our hospitable Australian kinsmen may count on a large contingent from the Dominion of Canada.

Climatic Conditions.

As it may be presumed that to many of those present here to-day Canada is almost an unknown country, I have thought that among one or two other subjects a few remarks on the atmospheric conditions and health resorts of the Dominion would not be without interest.

The best way to understand the atmospheric conditions of a country is first to understand its physical features. The physical features of Canada are very remarkable. Broadly speaking the country is separable by climatic and physical conditions into three great regions, the Eastern, Central, and Western Regions, which approximately run north and south in the general trend of the continent. The Eastern Region, which includes the older provinces of the Dominion, Ontario, Quebec, Nova Scotia, New Brunswick, and Prince Edward Island, besides the great fur territory stretching far to the east and north-east of James' Bay, extends from the Atlantic to Lake Superior and the chain of Great Lakes running in a northerly direction from Lake Superior to the Arctic Ocean. Between this great chain of lakes and the eastern base of the Rocky Mountains is the immense interior continental plain which constitutes the Central Region of Canada, its southern part consisting of open prairie, its northern part of forest lands. The third part of the division, the Western Region, is naturally very well defined, consisting of the wide and wild mountainous border of the Continent on the Pacific side—the Rocky, Selkirk, and Gold Ranges, which form the great Cordilleran belt, whose average width in Canada is 400 miles.

Eastern Canada, our first and largest region, is geologically of very ancient origin. Here geologists have placed the nucleus of the continent—the broad belt of crystalline rock of great antiquity called the Laurentian Plateau. This region is remarkable for its immense number of lakes large and small, and for its irregular and winding rivers with numerous rapids and falls. Between the Laurentian Plateau on the north and the Appalachian mountain system on the south, lies the great Valley of the River St. Lawrence. The basin of this majestic river covers 530,000 square miles, of which 460,000 are in Canada. Above the city of Quebec, the base of the Laurentian highlands and the ridges of the Appalachian system diverge, and the mighty river

flows through an extensive low country of notable fertility, in earlier days the great granary of Canada.

It may be added *en passant* that Mount Royal, which gives such distinction and character to our city, represents the basal remnants of a volcanic vent of great antiquity. From its picturesque summit may be seen similar abrupt elevations far off towards the east and south—Montarville, Belœil or St. Hilaire, Mt. Rougemont, with Mt. Yamaska behind it, Mt. Shefford, and the conical Mt. Johnson or Monnoir. The Adirondacks are visible in the distance to the south-west; and the Green Mountains to the south-east.

Included in the Eastern Region is one of the most remarkable geographical features of Canada—the great fresh-water lakes or inland seas, Superior, Huron, Erie, and Ontario, which form the perennial reservoirs of the St. Lawrence. Together with Lake Michigan, which is wholly in the United States, they have an aggregate area of 94,750 square miles, an area larger than that of Great Britain. They stand at four distinct levels above the sea—Ontario 247 feet, Erie 573, Huron 581, and Superior 602. The Niagara Falls, the greatest and most impressive of the natural wonders of our continent, are the direct result of the great height of Lake Erie above Lake Ontario, the river connecting the lakes being only a few miles long. Besides the St. Lawrence, Eastern Canada has several other great rivers, notably the Ottawa, which has a course of 1,800 miles and a basin of nearly 1,000,000 square miles, the St. Maurice, the Saguenay, and the St. John, the glory of New Brunswick, which, together with the Atlantic Slope, has a basin of 50,214 square miles. The Central and Western Regions also have their abundant share of large and small lakes and great rivers, an account of which would fill reams of paper. It should be noted that the Canadian rivers and lakes collectively cover an area of 130,000 square miles, and contain one-half the fresh water on the globe.

I draw special attention to this series of vast lakes and rivers because it exerts an immense and beneficent influence on the climate of Canada. It preserves the mean temperature while the land experiences the extremes. In summer the water is cooler and in winter warmer than the land conditions, which tend to modify the differences and to favour uniformity of climate. Without these waters, too, we should have vast regions of comparatively little value, as in Africa, Asia, and in the United States west of the Mississippi River, where large tracts of land far from water are nothing more than arid wastes. Our climate is more uniform than that of Europe ; the meteorological differences are produced by posi-

tion alone, but Europe has a higher mean temperature, and the extremes there are not so marked or so wide apart as in Canada. Owing to the great area of Canada, extending over 20° of latitude, or from the latitude of Constantinople to that of the North Cape in Norway, the range of temperature is naturally very wide. The southern boundary stretches over fully 4,000 miles, along which line we find that Southern Ontario has the latitude of Central Italy, Nova Scotia that of Northern Italy, Manitoba and Vancouver that of Central Germany. Speaking generally, the Canadian summer may be stated at 60° F. to 70° F.

From its vast and varied extent, Canada may be said to be the possessor of several climates. Taking Solly's classification as to position, we have in Canada all the three land climates, the low, the medium, and the high. The first has an elevation up to 2,500 feet, the second up to 4,500, and the third from 4,500 upwards. As to temperature and humidity, Canada comes under the category of "cold, moderate, and dry."

Health Resorts.

In the eastern region of the Dominion there are at least two localities which have been proved to possess many of the qualities which constitute a climate for convalescents from fevers and other depressing diseases, and also for consumption in the incipient stage. I refer to the region in the Province of Quebec among the Laurentians north of this city, of which the village of Ste. Agathe is the centre; the other being the Muskoka District, in Ontario.

The first has been called the Adirondacks of Canada, having many of the features, physical and climatic, of that now celebrated plateau situated in the north-eastern part of New York State, and stretching from the Mohawk Valley in the south 150 miles north, almost to the frontier line. The average elevation of the two regions is about the same, being from 1,600 to 1,800 feet. The immense pine forests, together with the moderate temperature, constitute the chief characteristics of the Canadian district, from the medical point of view. No very systematic meteorological observations have yet been taken of the St. Agathe region, but the indications will probably prove to be very similar to those of the American resort. It is in contemplation to erect a Sanitarium on Trembling Mountain, overlooking the village of Ste. Agathe, which will doubtless in time rival the Adirondack Cottage Sanitarium near Saranac Lake Village, which has proved such a marked success under the able management of Dr. E. L. Trudeau. The elevation of the Sanitarium will be 2,500 feet, thus

having an altitude of nearly 700 feet greater than the establishment at Saranac. It is the intention of the Quebec Government to set apart a sufficient portion of the Crown Lands to form a natural park in that part of the Province. It will be called the Trembling Mountain Park, and will cover an area of 100,000 acres of land, in which are several beautiful lakes. Within the boundaries of this park the Sanitarium will be constructed. There is therefore no reason to doubt that we shall shortly have within our own lines a health resort possessing all the advantages of the Adirondacks region, and capable of affecting for good the same class of patients now so decidedly benefited by a residence in those mountains.

One hundred miles north of Toronto, in the highlands of Ontario, is the Muskoka Lake region, an area of about 10,000 square miles, perhaps the most picturesque portion of the whole Province. Within this district, which has a mean altitude above the sea of about 800 feet (200 feet above Lake Huron), there are nearly a thousand lakes and ponds, connected by innumerable streams. The chief lakes are Muskoka, Rosseau, and Joseph. These contain about 400 islands. It is a region abounding in pine forests; the climate is dry, and the air pure and invigorating. The Muskoka region has been found undoubtedly to possess remarkable climatic advantages for those with phthisical tendencies. The death-rate from phthisis in this section of Ontario is proved to be less than one-tenth the rate which obtains in other parts of the Province. At Gravenhurst the Muskoka Cottage Sanitarium for the cure of incipient phthisis has recently been founded, under the best auspices, with accommodation for forty patients. The present Sanitarium consists of a large and well-planned main building, surrounded within easy distance by a number of small cottages. The grounds, which embrace seventy-five acres, are situated on Lake Muskoka. Pine forests and rocky ridges protect the buildings on the north and west sides, whence come the colder winds in winter. Like the Adirondacks Sanitarium, the intention is to occupy it all the year round. The progress of this institution, at present in the experimental stage, will be watched with much interest.

In the Central Region of Canada, that section of the Northwest Territories known as Southern Alberta—the home of the cowboy—has much to recommend it as a health resort. This strip of prairie and hill country is bounded on the north by the Canadian Pacific Railway, and on the south by the International boundary line; its eastern boundary extends as far as Medicine Hat; its western boundary to the summit line of the Rockies and British Columbia, comprising in all an area of about 20,000 square miles. The plain here

has an elevation above sea-level of 2,700 feet, which gradually increases up to the entrance of the Crow's Nest Pass, where the elevation is 4,500 feet. Calgary, the capital of Alberta, is itself 3,500 feet above sea-level. With this gradual incline from a low to a high level altitude the patient can choose the locality which suits his particular case. In a long experience Kennedy knew of only two cases of phthisis originating in that country—one of acute tuberculosis with a strong hereditary taint, which proved fatal; the other, of the ordinary type, recovered without leaving the place. He claims for the climate of Southern Alberta a dry aseptic atmosphere and a dry soil, the greatest possible number of sunshiny days (90 per cent.), with cool nights. Patients can live there all the year round, and with the exception of an occasional snowstorm, which may cover the prairie to a varying depth, nothing need interfere with their practically living in the saddle. The so-called Chinook wind has a remarkable influence over all this western section of Canada. It is a warm wind which blows with varying intensity from west to southwest. McCaul, who describes it very graphically, speaks of its approach being heralded by the massing of dark clouds above the mountain tops, and a distinct wailing and rumbling from the passes and gorges. Its effect in winter is little short of miraculous. When the real Chinook blows the temperature often rises in a few hours from 20° below to 40° above zero. The snow, which in the morning may have been a foot deep, disappears, and before night everything is dripping. But in the space of a single day all the water is lapped up by the thirsty wind, and the prairie is so dry that a horse's hoof hardly makes an impression.

The cases which have been most especially benefited by Alberta's climate are pulmonary tuberculosis in the earliest stage, although neurasthenics and anæmic women are likewise favourably affected to a marked degree. It is well-known that delicate lads sent from the British Isles to this section of the Northwest to work on the cattle ranches become in a year or two healthy and vigorous men, and are scarcely recognized on their return.

Still farther west, and nearly midway between Calgary and the Pacific Coast, is the beautiful Valley of Kamloops, another all-the-year-round resort which has much to commend it to those suffering from many forms of tuberculous disease. This picturesque valley, which lies between the Rocky Mountains and the Cascade Range, has a low altitude climate of 1,100 feet, but is exceedingly dry, showing an annual rainfall of only 11.05 inches, with an average of about 75 rainy days in the year. The rain soon disappears, the soil being light

and gravelly. In this region we have an illustration of the local variability of climate recently pointed out by Bryce, who, in referring to the two not very distant localities of Vancouver and Kamloops, showed that whereas the former has an annual rainfall of 35 inches, the latter records but 11 inches and a decimal, The mean annual temperature of the Valley of Kamloops is 46.03° F., the annual range being only 22.8. The tuberculous patients who appear to be most benefited by a residence in Kamloops are those in whom there is a tendency to chronic congestion. Cases of bronchitis are likewise said to do well there. The climate can also be recommended for consumptives in whom cardiac disease exists as a complication.

The Effect of the Canadian Climate on European Races.

That Canada is an exceptionally healthful country is the general testimony of the army and navy surgeons who have been stationed in Canada with the different regiments from the time of the conquest to the present day. Crawford, who was attached to one of the regiments stationed in Montreal many years ago, and who subsequently left the army and practised in this city, published elaborate and carefully collected statistics to prove that few portions of the British Empire have a climate equal to that of Canada. In fact his statistics prove conclusively that out of every 1,000 of the troops stationed at the various garrisons throughout the Empire, the percentage constantly ineffective from sickness was smaller in this country by 7 per cent. than at Gibraltar, which was then taken as the type. I think it can be satisfactorily proved that Canada is expressly fitted to develop a hardy race capable of great endurance. The races of the British Isles and the French race have certainly not degenerated here. Hingston proved this very conclusively some years ago by observations made upon the medical students attending the various schools in this city. He found that the lumbar strength of the British Canadian of the third generation exceeded by 20 lbs. that of the recently arrived English and Scotch students. But the French-Canadian of the tenth generation did better than all by nearly 30 lbs. Not only has the French-Canadian increased in strength but also in height and weight over the original Normandy stock.

Has the intellectual improvement in our people kept pace with the physical? We are a modest people, but I think we can say with truth thatit has. We have a very respectable literature of our own, but the best intellect of the country is as yet absorbed in the practical affairs of life, and has too seldom found expression in art and literature. It is not very long since a distinguished American litter-

ateur, Charles Dudley Warner, gravely attributed what he called the literary inactivity of Canada to the coldness of the climate. He said, in short, that the cold benumbed our intellectual faculties, and we had to spend so much of our energy in trying to keep warm that none was left for any other purpose. It must be admitted that if we measure the intellectual capacity of our people by the number of books produced in Canada the result is not all we might desire; but the climate is not to blame. Especially is it not the cold, for the winter is the season devoted pre-eminently to intellectual effort and intellectual amusements. If Mr. Warner had said that the heat of our summer was an unfavourable factor in our intellectual life he would not have shot quite so wide of the mark; he would not have been right but he would not have been quite so wrong. The very vicissitudes of our climate, by training the system to endure severe physical conditions must react favourably upon the mental attitude.

Canadian Spas.

We have in Canada several mineral springs of undoubted therapeutic value, and they are pretty generally distributed all over the Dominion, although differing materially in temperature and composition. The best known Canadian spas are the Caledonia, the St. Leon and the Plantagenet Springs, in the Province of Quebec, and the Banff Springs in Alberta. Other springs in the Province of Quebec are the Abenakis and the Caxton. Besides these there are at least three or four artesian wells or springs. Of these the chief are the Laurentian Spring in the east end of this city (a mild alkaline water with sodium bicarbonate as its predominating ingredient), and the Radnor, a well of some considerable repute situated in the County of Champlain. This was discovered a very few years ago when boring for water to supply the workpeople engaged at the well known Radnor Forges. It has been likened to the German Seltzer, many of the properties being alike. It bids fair to become a rival in time of the celebrated Apollinaris water, to which it is preferred by many The well is over 400 feet in depth. In the Province of Ontario the chief springs are the Winchester and the Preston, and those in the town of St. Catharines, near Niagara Falls. The best known and the most popular are the Caledonia Springs, situated on the line of the Canadian Pacific Railway about midway between Montreal and Ottawa, and about nine miles from the Ottawa River. They consist of four springs—the gas, the saline, the white sulphur, and the intermitting or Duncan spring. The first three are situated within a distance of three or four rods of each other, and the mouths of the

latter two are not more than four feet apart. The intermitting spring is situated about two miles from the others. This is so named because the discharge of gas is not regular, some minutes elapsing between the periods of quiescence and disturbance. The average temperature of these springs is about 46° F. The intermitting spring has the largest percentage of chloride of sodium, and differs from all the others in possessing a greater portion of chlorides of calcium and magnesium. It has also nearly twice the proportion of carbonate of magnesium that the others contain. It has been found that taken judiciously and under advice these waters have a remarkable effect in subacute and chronic rheumatic conditions. People suffering thus are found flocking to Caledonia from all parts of this continent and even South America, especially during the months of July and August. Gouty conditions depending upon liver disturbances also yield very readily to these waters. The waters of St. Leon and Plantagenet are similar in many respects to those just described, and as a rule suit the same class of patients.

All the springs so far mentioned yield cold waters. But Canada also possesses the most famous thermal springs on this continent.

Banff, now a picturesque town magnificently situated in the heart of the Rocky Mountains yet within the limits of that division of the Northwest Territories known as Alberta, has become one of our noted health resorts, although frequented more on account of its remarkable thermal springs than for its climatic advantages. The town is built on the banks of the Bow and Spray rivers, two large glacier streams, and is surrounded by mountains towering many thousands of feet above the level of the sea. The winter is short, beginning in December and ending in February, and is much milder than in Ontario. Very little rain falls, and the days as a rule are bright and cloudless. Prolonged periods of warm weather are experienced during winter. March and April are variable ; May is warm and bright ; June is the month in which the greatest rainfall occurs ; July August, September, and October are very warm and very dry, with cool nights. At all seasons with the exception perhaps of June the air is dry and notably aseptic. It is positively stated that no case of malaria or tuberculosis has ever been known to originate at Banff. Independently of the springs, then, Banff has much to recommend it from a climatological standpoint.

The far-famed Thermal Springs, of Banff, were only discovered ome 15 years ago during the construction of the Canadian Pacific Railway. At its source in the mountain side it has a temperature of 127° F. and the air is charged for some distance around with the

steam emitted from the pool to which the water flows. The most recent analysis shows it to contain the following ingredients :—

Calcium sulphate	56.85
Magnesium sulphate	12.39
Calcium carbonate	3.29
Sodium sulphate	15.60
Sodium carbonate	35.73
Silica	traces.
Organic matter	traces.

The waters of Banff have been used with great benefit in rheumatism, gout, sciatica, and glandular affections, in certain forms of skin disease, and especially, it is thought, in tuberculous affections of the skin and mucous membrane. Aided by the admirable climatic conditions the waters have also been found to benefit in a marked manner functional diseases of the liver, stomach, and kidneys, and tuberculous joint affections. In constitutions debilitated from any cause the activity of the skin is noticed to be increased, the heart and vascular system strengthened and the muscular and nervous systems much improved in tone. Rachitic and delicate children are much benefited by the Thermal Springs. This seems a large order; but the therapeutic effects of these springs have been carefully studied by competent medical men who have been stationed there for some years. The climate doubtless assists materially the action of the waters in very many cases.

I doubt if the Canadian profession sets a sufficiently high value on the therapeutic properties of our own mineral springs. When visiting the Spas of Great Britain and Europe, one is impressed by the caution exercised by patients in the method of using the waters which have been prescribed. There, competent local medical men are always to be found who can give the proper advice regarding the water to be taken for the ailment from which the patient suffers, and the judicious use of baths. Here, unfortunately, in many places no professsional advice is available, and the patient consequently does very much as he pleases, or as the hotel proprietor may advise, and in consequence more harm than good some times follows the use of the waters.

Medical Education in Canada.

The general question of medical education is one of great importance and of unceasing interest, nor is this interest confined to the profession : it is becoming universal. The needs of medical education are fortunately being more fully realised by those who on account of their wealth and influence are in a position to render that substantial assistance which is so requisite. The time was when every medical school was a purely proprietory concern "run" for the money that

was in it. We feel in Canada, and I think I can speak for the profession in the neighbouring republic, that this day is passed, that high-minded philanthropists like Sir Donald Smith (now Lord Strathcona and Mount Royal,) the late John Henry Molson, the McDonalds, the Drakes and others with us, and the Johns Hopkins, the Stanfords, the Vanderbilts, the Rockefellers, the Miss Garretts and others with them are beginning to realise that unendowed instruction in medicine must lead to imperfect results, and that private endowment, in the absence of state aid, has become an absolute necessity to a proper medical training. I am not an advocate for state aid to universities, and I rejoice that the University to which I have the honour to belong is not so dependent, as it might thus be deprived of those gifts of private munificence to which I have just referred. All honour to those far-seeing, open-handed men and women who are giving of their abundance in order to elevate the standard of medical education and by so doing benefit their kind. As Gould very tersely puts it in one of his clever articles: "I think our reliance must be upon private bequests, and these can be secured only as we interest the rich. We must never weary in showing the neglect of the greatest, most palpable, most certain means of doing good. There is a strange fatality in men, an unaccountable inability of seeing the need that lies nearest the good that is dearest. There is more money to-day devoted to astronomy than to the prevention of disease. It is positively wonderful to think that men should be more interested in stars and constellations than in their bodies and their physiological life."

A question which is now-a-days agitating the minds of those especially interested in medical education is the kind of groundwork which is likely to bear the most direct relation to the future studies of the medical student. I think it is now conceded by all that he is placed at a greater advantage who first passes through an arts or a science course. I am happy to be able to report that from 15 to 20 per cent of those who are studying medicine in this country to-day have had a collegiate training in either arts or science. Which of the two should the parent or guardian choose? Had I a son whose instincts were in the direction of medicine I think I should choose for him the science course. The late Professor Huxley thought it was a most self-evident proposition that the educational training for persons who proposed to enter the medical profession should be largely scientific; not merely or even principally because an acquaintance with the elements of physical and biological science is absolutely essential to the comprehension of human physiology and pathology; but still more because of the value of the discipline afforded by

practical work in these departments in the process of observation and experiment, in inductive reasoning and in manipulation.

The subjects in the science curriculum might be specially selected for the future medical student. Of course it may be said in favour of the arts course that many of the subjects such as physics and chemistry constitute part of the curriculum; but then calculate the loss to the future surgeon of that training of the hand and eye which would lead him up to be a skilled operator; or to the scientific physician whose complicated instruments of percision employed in the diagnosis of disease need some mechanical knowledge for both their use and repair. Besides the number of those and their complexity has been increasing with the increase of scientific knowledge.

Bnt can we not make a new departure, can we not urge that a special scientific education be arranged by the universities for those who desire to enter the medical profession? Such a course would embrace elementary Latin and Greek, French and German, physics, chemistry, biology, psychology, elementary mechanics, a practical laboratory course on electricity and drawing. After two years study this might entitle the successful candidate to the degree of Licentiate in Science.

Something of this kind has been recently attempted in the University of McGill. By a special arrangement with the Faculty of Arts it is now possible for students to obtain the degree of B.A. along with M.D., C.M., after only six years of study, It has been decided to allow the primary subjects (anatomy, physiology, and chemistry) in medicine to count as subjects of the third and fourth years in Arts. It follows, then, that at the end of four years study a student may obtain his B.A. degree and have two years of his medical course completed. The last two years of study are of course devoted to the third and fourth year subjects in medicine. A certificate of Licentiate in Arts will be given along with the professional degree in medicine to those who previous to entrance upon their professional studies proper have completed two years in the Faculty of Arts, and have fully passed the prescribed examinations therein. By this plan also during the first two years of the arts course the medical student practically completes his studies in physics, chemistry, botany, and elementary psychology. This scheme is still in the experimental stage, but there is every reason to believe that it will result satisfactorily. What deters so many from taking a full course in Arts or Science before entering Medicine is the length of time consumed before the doctorate degree is reached, although I hope the time is not far distant when every graduate in Medicine in Canada shall of necessity be also a graduate in Arts or

Science. I might state that the standard for the ordinary matriculation examination for entrance to medicine exacted by all universities and licensing boards in this country is, with one or two exceptions, very high. I doubt if the requirements in this way, of the Medical Council of Great Britain are any higher.

The Medical Schools of Canada.

Now as to the purely PROFESSIONAL part of medical education I may state that we have in the Dominion of Canada no fewer than 11 medical schools, including one for women only, all having the power of granting degrees and all connected directly or by affiliation with university bodies. To enumerate them: Beginning with the Atlantic Provinces, we have in Halifax the medical school attached to Dalhousie University, the only medical school in the Maritime Provinces; in this province there are four schools, Laval in Quebec, Laval in Montreal, McGill and Bishop's in Montreal; in Ontario, four schools, namely, the Royal College of Physicians and Surgeons, Kingston; the University of Toronto Medical Faculty, Trinity Medical College, and the Ontario Women's Medical College, in Toronto; in London, Ontario, the Western University Medical Faculty; and lastly, in Winnipeg, the Manitoba University Faculty of Medicine. All told, we had in Canada, during the last winter sessions 286 teachers, including professors, lecturers, and demonstrators, and 1736 students. The tendency for the past few years has been to increase the teaching staff quite out of proportion to the increased number of students. Taking McGill we find that there are in the present year 53 teachers for 388 students, being a proportion of nearly one to eight. Laval, in Montreal, has 36 teachers and 197 students, a still greater proportion. The Toronto School of Medicine had during the past year 41 teachers and 293 students. We find that this proportion compares well with the larger schools in the United States; thus, in 1893, there were in Harvard Medical School 71 teachers to look after 471 students; at the Columbia Medical College in New York with 661 students there were 105 teachers (1 to 6); in the University of Pennsylvania the teaching staff in the same year comprised only 84 members with 825 students, being a little over 1 to 10. What does this mean? Ten years ago when McGill had 237 students, a staff of 23 professors and demonstrators was considered sufficient. Why are so many more thought necessary now-a-days? The number of subjects taught has not increased very much. The answer is that the subjects are differently taught, the old-fashioned daily didactic lectures are now given two or three times a week only; but I should be

sorry to see them further reduced in number, for I believe that so many are absolutely necessary. It is in the dissecting room, the chemical, physiological, therapeutical, and pathological laboratories that we see the change. These which before were for the most part only "side shows" are now made to hum with the practical work which is done within them, while demonstrators are moving about busily, engaged in examining and instructing.

In clinical teaching also we have made marked advances. A creation of the last few years is the clinical demonstrator, who takes small classes of students into the wards or the out-door department of our hospitals and gives them that "bedside instruction" which is so essential; leaving the clinical professor to deal with the full classes in the lecture or operating room. Thus each student is enabled personally to examine the case, to study the physiognomy of disease, and to make deliberate, thorough, and systematic examinations. He thus learns to use his special senses and gets into careful habits of observation which once thoroughly acquired will be found to contribute largely to future success. With this in view we encourage students to attend the out-patient department of the hospitals as early as the second year.

In order to make the clinical instruction more complete and more thorough, chemical and bacteriological laboratories have been added to the pathological departments of our hospitals. Thus it will be seen that laboratory methods everywhere prevail, all with the idea of developing the scientific spirit in students and of cultivating methods of thought with observation.

The question sometimes arises, however, May the student not be getting too much of a good thing? Is it not possible that laboratory teaching may be overdone? because, as Welch very truly says, "The student whose knowledge of a subject is derived exclusively from laboratory courses is likely to lose his perspective in details, to acquire only a fragmentary knowledge of the subject, to fail to comprehend the general bearing of observed facts; and not to acquire the general principles and systematic conceptions which are essential. Laboratory work should be accompanied and supplemented by the reading of text-books and by lectures." I am convinced that with us in Canada laboratory work is not overdone, but, on the contrary, in some departments needs and deserves further encouragement. I hope every laboratory teacher in the country realizes that the object of a college is to give a good general education, and not to make experts in various branches. I have long felt myself, however, that the didactic lectures were being unfairly dealt with. There is a feeling

abroad that they should be practically elbowed out of sight. I think the didactic lecture has its place in the medical course; and while I quite feel that the old plan of compelling students to listen to five didactic lectures a week in all of the great subjects was a mistake, I still feel that a good lecturer can teach in this way a certain something which cannot be imparted by practical instruction or by recitations. The personal influence of a good lecturer very often makes an impression which nothing else can make; and if such lectures are made also demonstrative, as by the use of diagrams, the lantern, experiments, &c., they must of necessity fill a very important place in the medical course.

The Teaching of Hygiene in Canada.

Hygiene is at last receiving in this country the attention which its importance demands: all medical schools in Canada have facilities for teaching it. In McGill University the scope of the teaching of hygiene has been vastly extended, thanks to the generous endowment of that department recently by the Chancellor, the Right Hon. Lord Strathcona and Mount Royal. The subject can now be taught in a scientific and, at the same time, eminently practical manner. There will be three teachers associated with the professor himself, viz., the heads of the Departments of Practical Chemistry, of Pathology, and of Bacteriology. This is following very much the German system, also adopted by the University of Pennsylvania, the chemical and bacteriological aspects of the subject being really regarded as the most important. An extensive working museum, with sanitary apparatus of every kind, forms part of the scheme, and will doubtless add greatly to the efficiency of the course when it is completed. Should the experiment succeed you will be rejoiced to hear at no distant date that the other schools in Canada have followed the lead of their elder sister.

I fear I have given you a very imperfect idea of medical education in Canada; and it may be charged against me that I have been partial in my description to my own University; but I assure you that such was furthest from my thoughts. The Medical Faculty of McGill University has the right of seniority and might fairly, I think, be taken as a type of Canadian Medical Schools. Be assured there is no mean spirit of rivalry abroad. We are all working with one object only, the advancement of medicine in Canada. The teaching facilities of some medical schools in this country may be, and are actually greater than others, owing to the munificence of citizens, and the school attached to McGill is, I am happy to say in that position;

but although assistance has been rendered in a general way, with two exceptions, the chairs are still unendowed. Yet we have great expectations which we hope will be realized in the near future. Let us hope that our sister universities throughout Canada will be equally fortunate; so that before long we shall be able to report that we are all marching abreast equally equipped.

Clinical Teaching in Canada.

The facilities for clinical teaching in the larger cities of Canada are admirable. Speaking for the city of Montreal, we have in the five general hospitals, the Hotel Dieu, Montreal General, Notre Dame, Royal Victoria and Western Hospitals nearly 800 beds. The number of students attending the three medical schools was last session 646; and considering that only about half—those of the third and fourth years—have access to the wards, there will be at least two beds for each student. The number of outdoor patients attending the five hospitals daily would aggregate at least 300, so that there can be no possible cause for complaint regarding both the quantity and quality of clinical material available in this city.

Nurses and Nursing in Canada.

While on the subject of hospitals, I would take this opportunity of saying that the training schools attached to the larger English hospitals are in a very flourishing condition and are found to contribute not a little towards the thoroughness of the practical teaching. It was my intention to have referred at some length to the whole question of Nurses and Nursing, but the limits of this address forbid. I might say, however, while as a profession we feel the absolute necessity for the training school, and thoroughly appreciate the services of the well trained nurse, both in hospital and in private practice, there is the fear that the supply may soon exceed the demand. A project is on foot now, however, which may delay, if not actually prevent, such a result. I refer to the recent establishment by that most estimable and charitable woman, the Countess of Aberdeen, of the Victorian Order of Nurses—another outcome of the jubilee of our beloved Queen. Her Excellency's idea in establishing this order is to supply the sparsely settled parts of our great Northwest, the outlying districts of Canada generally, and the poor in towns and cities with nursing aid. In this great work hundreds of nurses will in time be employed. The scheme, which is purely non-sectarian, and appeals to all, irrespective of nationality, when thoroughly worked out and more generally understood will become one of our national institutions. Let us wish it every success.

Medical Legislation in Canada.

Time will not permit of my discussing the subject of medical legislation in Canada at any length ; and besides you will find it very fully treated in the excellent Official Guide or Souvenir, prepared for you by the Executive Committee. In addition I might explain, however, that when the British American provinces became confederated in 1867, under the British North America Act, the governance of educational matters was taken away from the Federal authorities and handed over to the provinces each to look after them in its own way. In consequence we have since had a curious complexity of Medical Legislation, there being practically no uniformity amongst the provinces in regard to standard of study or qualification for practice. Each province has its own medical board or medical council, as the case may be, which has the power to grant licence to practise either after examination or on simply presenting the diploma of certain recognised universities. In the provinces of Ontario and British Columbia an examination is exacted ; in the others the license is given under certain restrictions on presentation of the degree, although in the Maritime Provinces an examining board is now about to be established. In this way, as can readily be seen, a Chinese wall is built round each province, and the frontier is carefully guarded so that it is unsafe for a medical man to pass from one to the other unarmed with a license, because of the risk of fine or even imprisonment. Such a condition of affairs is hardly credible and probably exists nowhere else to the same extent. What is the remedy ? Two remedies have been suggested—either the establishment of a central examining Board in each province with a uniform standard of matriculation and a uniformly high standard of curriculum which shall in time lead up to a general scheme of reciprocity ; or, secondly, a Dominion Examining Board. The first scheme is at present under serious consideration ; although there are many difficulties in the way of its accomplishment, no one of them is insuperable, however, providing a spirit of conciliation prevails. The second alternative (a Dominion Examining Board) would in many respects be more desirable, because not only could the licentiate practise in any part of the Dominion, but he could register in Great Britain, and thus receive recognition all over the Empire. As you are doubtless aware, we, as a profession, suffer in this country from being inhabitants of provinces which are confederated. Under the Medical Act, now of some twelve years standing, it has been decided in effect that the Medical Council of the United Kingdom can recognize the degrees of universities situated in autonomous Provinces only. As a consequence, Australians obtain privileges which are

denied to us, being permitted to register in Great Britain without examination. We are being punished for be longing to a colony whose form of Government is recognized to be in advance of theirs and likely to be imitated by them. Let us give our Australian brethren a hint: if the confederation of your provinces be in contemplation, see to it that all matters of professional education are left in the hands of the Central Government, at least as far as qualification for registration is concerned. By so doing you will avoid the almost inextricable tangle in which we in Canada find ourselves. Let common school education go to the various provinces if you will, but for the profession of medicine (and doubtless law also) there should be a uniform standard of matriculation, a uniform curriculum of medical studies, and one Central Examining and Registering Board composed of the best men from all the universities. We hope in Canada to reach that ideal at no distant date; in fact I have the very best authority for stating that it is not impossible of accomplishment. Some scheme of reciprocity first arranged would doubtless make the task less difficult, but failing that, our duty is to arrange for some legislation which shall give our better and more ambitious students an opportunity of passing a Dominion Licensing Board (or whatever it may be called) which shall give the privilege of practising their profession not only in any part of their native country, but in any part of the world over which the British flag flies. Such a scheme need not interfere in any way with the autonomy of the provinces. Each may still retain its Provincial Board for the purpose of examining and issuing licenses to those candidates who are satisfied to practise their profession in the limited sphere of their own provinces. I think the legislators of this country will some day (and not far distant either) be induced to see that the system which at present obtains is unworthy of a great and growing country.

In conclusion, allow me to express the hope that the arrangements made by the Executive Committee for the entertainment of our guests may meet with appreciation and approval. and that the memories of the brief sojourn here may be all that is bright and happy. The loyalty and unanimity with which the profession throughout the Dominion has coöperated with us in Montreal to make this meeting of the British Medical Association a success from every point of view, deserves and receives our heartiest thanks. We are also greatly indebted for the kind and ready assistance of the Dominion Government, the Quebec Government, and the Civic Government of Montreal. Our hands have been strengthened and the cause we have so much at heart has been furthered by the active good-will of the country's official representatives.

One word more : It is a good thing to be here to-day, in the midst of this great gathering so full of power and vigour. The fruits of such a gathering should be tangible, enduring, not ephemeral, not for to-day, but for all time. To our kinsmen from beyond the great seas let me express the earnest hope that in the future our kinship will be a more real and living thing than in the past. We are members of one great family, members one of another, in a peculiar and very real sense. Let that once be recognized, and the statesman's task will be an easy one. In more than words has Canada shown herself worthy of her high heritage, worthy of a part in the Empire, worthy to share in its trials and its triumphs. We, who know her history, can say with well-founded confidence :

> " So in the long hereafter this Canada shall be
> The worthy heir of British power and British liberty,
> Spreading the blessing of her sway to her remotest bounds,
> While with the fame of her fair name a continent resounds,
> True to her traditions, to Britain's ancient glory,
> Of patient saint and martyr, alive in deathless story ;
> Strong in their liberty and truth to shed from shore to shore
> A light among the nations till nations are no more."

BRITISH MEDICINE IN GREATER BRITAIN.[1]

BY

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To trace successfully the evolution of any one of the learned professions would require the hand of a master—of one who, like Darwin, combined the capacity for patient observation with philosophic vision. In the case of medicine the difficulties are enormously increased by the extraordinary development which belongs to the history of the present century. The rate of progress has been too rapid for us to appreciate, and we stand bewildered and, as it were, in a state of intellectual giddiness, when we attempt to obtain a broad, comprehensive view of the subject. In a safer 'middle flight' I propose to dwell on certain of the factors which have moulded the profession in English-speaking lands beyond the narrow seas—of British medicine in Greater Britain. Even for this lesser task (though my affiliations are wide and my sympathies deep) I recognize the limitations of my fitness, and am not unaware that in my ignorance I shall overlook much which might have rendered less sketchy a sketch necessarily imperfect.

Evolution advances by such slow and imperceptible degrees that to those who are part of it the finger of time scarcely seems to move. Even the great epochs are seldom apparent to the participators. During the last century neither the colonists nor the mother country appreciated the thrilling interest of the long-fought duel for the possession of this continent. The acts and scenes of the drama, to them detached, isolated and independent, now glide like dissolving views into each other, and in the vitascope of history we can see the true sequence of events. That we can meet here to-day, Britons on British soil, in a French province, is one of the far-off results of that struggle. This was but a prelude to the other great event of the eighteenth century: the revolt of the colonies and the founding of a second great English-speaking nation—in the words of Bishop Berkeley's prophecy, "Time's noblest offspring."

Surely a unique spectacle that a century later descendants of the actors of these two great dramas should meet in an English city in

[1] The Address in Medicine at the British Medical Association, Montreal, Aug. 31st, 1897.

New France! Here, the American may forget Yorktown in Louisbourg, the Englishman Bunker Hill in Quebec, and the Frenchman both Louisbourg and Quebec in Chateauguay ; while we Canadians, English and French, in a forgiving spirit, overlooking your unseemly quarrels, are only too happy to welcome you to our country—this land on which and for which you have so often fought.

Once, and only once, before in the history of the world could such a gathering as this have taken place. Divided though the Greeks were, a Hellenic sentiment of extraordinary strength united them in certain assemblies and festivals. No great flight of imagination is required to picture a notable representation of our profession in the fifth century B.C. meeting in such a colonial town as Agrigentum, under the presidency of Empedocles. Delegates from the mother cities, brilliant predecessors of Hippocrates of the stamp of Damocedes and Herodicus, delegates from the sister colonies of Syracuse and other Sicilian towns, from neighboring Italy, from far distant Massilia, and from still more distant Panticapæum and Istria. And in such an assemblage there would have been men capable of discussing problems of life and mind more brilliantly than in many subsequent periods, in proportion as the pre-Hippocratic philosophers in things medical had thought more deeply than many of those who came after them.

We English are the modern Greeks, and we alone have colonised as they did, as free peoples. There have been other great colonial empires, Phœnician, Roman, Spanish, Dutch and French, but in civil liberty and intellectual freedom Magna Græcia and Greater Britain stand alone. The parallel so often drawn between them is of particular interest with reference to the similarity between the Greek settlements in Sicily and the English plantations on the Atlantic coast. Indeed, Freeman says: "I can never think of America without something suggesting Sicily, or of Sicily without something suggesting America" I wish to use the parallel only to emphasise two points, one of difference and one of resemblence. The Greek colonist took Greece with him. Hellas had no geographical bounds, "Massilla and Olbia were cities of Hellas in as full sense as Athens or Sparta." While the emigrant Britons changed their sky, not their character, in crossing the great sea ; yet the home-stayers had never the same feeling toward the plantations as the Greeks had towards the colonial cities of Magna Græcia. If, as has been shrewdly surmised, Professor Seely was Herodotus reincarnate, how grieved the spirit of the father of history must have been to say of Englishmen, "nor have we even now ceased to think of ourselves as simply a race inhabiting an island

off the northern coast of the Continent of Europe." The assumption of gracious superiority which, unless carefully cloaked, smacks just a little of our national arrogance, is apt to jar on sensitive colonial nerves. With the expansion of the Empire, and the supplanting of a national by an imperial spirit this will become impossible. That this sentiment never prevailed in Hellas, as it did later in the Roman Empire, was due largely to the fact that in literature, in science and in art, the colonial cities of Greece early over-shadowed the mother cities. It may be because the settlements of greater Britain were things of slower growth that it took several generations and several bitter trials to teach a lesson the Greeks never had to learn.

The Greek spirit was the leaven of the old world, the workings of which no nationality could resist; thrice it saved western civilisation, for it had the magic power of leading captivity captive and making even captive conquerors the missionaries of her culture. What modern medicine owes to it will appear later. "The love of science, the love of art, the love of freedom—vitally correlated to each other, and brought into organic union," were the essential attributes of the Greek genius (Butcher). While we cannot claim for the Anglo-Saxon race all of these distinctions it has in a high degree that one which in practical life is the most valuable, and which has been the most precious gift of the race to the world—the love of freedom,

> "Of freedom in her regal seat
> Of England."

It would carry me too far afield to discuss the differences between the native Briton and his children scattered so widely up and down the earth. In Canada, South Africa, Australia and New Zealand, types of the Anglo-Saxon race are developing which will differ as much from each other, and from the English, as the American does to-day from the original stock; but amid these differences can everywhere be seen those race-qualities which have made us what we are—'courage, national integrity, steady good sense, and energy in work.' At a future meeting of the Association, perhaps in Australia, a professional Sir Charles Dilke with a firm grasp of the subject may deal with the medical problems of Greater Britain in a manner worthy of the address in medicine. My task, as I mentioned at the outset, is much less ambitious.

Could some one with full knowledge patiently analyse the characteristics of British medicine he would find certain national traits, sufficiently distinct for recognition. Three centuries cannot accomplish very much (and that period has only just passed since the revival of medicine in England), but the local conditions of isolation, which

have been singularly favourable to the development of special peculiarities in the national character, have not been without effect in the medical profession. I cannot do more than touch upon a few features, which will be useful as indicating the sources of influence upon Great Britain in the past, and which may perhaps be suggestive as to lines of progress in the future.

Above the fire place in Sir Henry Acland's study are three pannelled portraits of Linacre, Sydenham and Harvey; the scroll upon them reads *Litteræ, Praxis, Scientia.* To this great triumvirate—as to the fountain heads, we may trace the streams of inspiration which have made British medicine what it is to-day.

Linacre, the type of the literary physician, must ever hold a unique place in the annals of our profession. To him was due in great measure the revival of Greek thought in the 16th century in England; and in the last Harveian oration, Dr. Payne has pointed out his importance as a forerunner of Harvey. He made Greek methods available; through him the art of Hippocrates and the science of Galen became once more the subject of careful, first-hand study. Linacre, as Dr. Payne remarks, "was possessed from his youth till his death by the enthusiasm of learning. He was an idealist devoted to objects which the world thought of little use." Painstaking, accurate, critical, hyperitical perhaps, he remains to-day the chief literary representative of British medicine. Neither in Britain nor in Greater Britain have we maintained the place in the world of letters created for us by Linacre's noble start. It is true that in no generation since has the profession lacked a man who might stand unabashed in the temple at Delos; but judged by the fruits of learning scholars of his type have been more common in France and Germany. Nor is it to our credit that so little provision is made for the encouragement of these studies. For years the reputation of Great Britain in this matter was sustained almost alone by the great Dee-side scholar, the surgeon of Banchory, Francis Adams,—the interpreter of Hippocrates to English students. In this century he and Greenhill have well maintained the traditions of Linacre. Their work, and that of a few of our contemporaries, among whom Ogle must be specially mentioned, has kept us in touch with the ancients. But by the neglect of the study of the humanities, which has been far too general, the profession loses a very precious quality.

While in critical scholarship and in accurate historical studies, British medicine must take a second place, the influence of Linacre exerted through the Royal College of Physicians and the old Universities, has given to the humanities an important part in education, so that they

have moulded a larger section of the profession than in any other country. A physician may possess the science of Harvey and the art of Sydenham, and yet there may be lacking in him these finer qualities of heart and head which count for so much in life. Pasture is not everything and that indefinable, though well understood, something which we know as breeding, is not always an accompaniment of great professional skill. Medicine is seen at its best in men whose faculties have had the highest and most harmonious culture. The Lathams, the Watsons, the Pagets, the Jenners, and the Gairdners have influenced the profession less by their special work than by exemplifying those graces of life and refinements of heart which make up character. And the men of this stamp in Greater Britain have left the most enduring mark,—Beaumont, Bovell and Hodder in Toronto; Holmes, Campbell and Howard in this city; the Warrens, the Jacksons, the Bigelows, the Bowditches, and the Shattucks in Boston; Bard, Hossack, Francis, Clark, and Flint of New York; Morgan, Shippen, Redman, Rush, Coxe, the elder Wood, the elder Pepper, and the elder Mitchell of Philadelphia—Brahmins all, in the language of the greatest Brahmin among them, Oliver Wendell Holmes,—these and men like unto them have been the leaven which has raised our profession above the dead level of a business.

The *litteræ humaniores*, represented by Linacre, revived Greek methods; but the Faculty during the sixteenth and at the beginning of the seventeenth centuries was in a slough of ignorance and self-conceit, and not to be aroused even by Moses and the prophets in the form of Hippocrates and the fathers of medicine. In the pictures referred to, Sydenham is placed between Linacre and Harvey; but science preceded practice, and Harvey's great Lumleian lectures were delivered before Sydenham was born. Linacre has been well called, by Payne, Harvey's intellectual grandfather. "The discovery of the circulation of the blood was the climax of that movement which began a century and a half before with the revival of Greek medical classics, and especially of Galen."—(Payne.) Harvey returned to Greek methods and became the founder of modern experimental physiology and the great glory of British scientific medicine. The demonstration of the circulation of the blood remains in every detail a model research. I shall not repeat the oft-told tale of Harvey's great and enduring influence, but I must refer to one feature which, until lately, has been also a special characteristic of his direct successors in Great Britain. Harvey was a practitioner and a hospital physician. There are gossiping statements by Aubrey to the effect that "he fell mightily in his practice" after the publication of the *De*

motu cordis, and that his "therapeutic way" was not admired; but to these his practical success is the best answer. It is remarkable that a large proportion of all the physiological work of Great Britain has been done by men who have become successful hospital physicians or surgeons. I was much impressed by a conversation with Professor Ludwig in 1884. Speaking of the state of English physiology, he lamented the lapse of a favourite English pupil from science to practice; but, he added, "while sorry for him, I am glad for the profession in England." He held that the clinical physicians of that country had received a very positive impress from the work of their early years in physiology and the natural sciences. I was surprised at the list of names which he cited; among them I remember Bowman, Paget, Savory and Lister. Ludwig attributed this feature in part to the independent character of the schools in England, to the absence of the University element so important in medical life in Germany, but, above all, to the practical character of the English mind, the better men preferring an active life in practice to a secluded laboratory career.

Thucydides it was who said of the Greeks that they possessed "the power of thinking before they acted, and of acting, too." The same is true in a high degree of the English race. To know just what has to be done, then to do it, comprises the whole philosophy of practical life. Sydenham—*Angliæ lumen*, as he has been well called, is the model practical physician of modern times. Linacre led Harvey back to Galen, Sydenham to Hippocrates. The one took Greek science, the other not so much Greek medicine as Greek methods, particularly intellectual fearlessness, and a certain knack of looking at things. Sydenham broke with authority and went to nature. It is an extraordinary fact that he could have been so emancipated from dogmas and theories of all sorts. He laid down the fundamental proposition, and acted upon it, that "all diseases should be described as objects of natural history." To do him justice we must remember, as Dr. John Brown says, "in the midst of what a mass of errors and prejudices, of theories actively mischevous, he was placed, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums." Sydenham led us back to Hippocrates, I would that we could be led oftener to Sydenham! How necessary to bear in mind what he says about the method of the study of medicine." In writing therefore, such a natural history of diseases, every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness. The useful-

ness of this procedure cannot be easily overrated, as compared with the subtle inquires and trifling notions of modern writers, for can there be a shorter, or indeed any other way of coming at the morbific causes, or discovering the curative indications than by a certain perception of the peculiar symptoms? By these steps and helps it was that the father of physic, the great Hippocrates, came to excel, his theory being no more than an exact description or view of Nature. He found that Nature alone often terminates diseases, and works a cure with a few simple medicines, and often enough with no medicines at all." Well indeed has a recent writer remarked "Sydenham is unlike every previous teacher of the principles and practice of medicine in the modern world." Sydenham, not Linacre or Harvey, is the model British physician in whom were concentrated all those practical instincts upon which we lay such stress in the Anglo-Saxon character.

The Greek faculty which we possess of thinking and acting has enabled us, in spite of many disadvantages, to take the lion's share in the great practical advances in medicine. Three among the greatest scientific movements of the century have come from Germany and France. Bichât, Lænnec and Louis laid the foundation of modern clinical medicine; Virchow and his pupils of scientific pathology; while Pasteur and Koch have revolutionized the study of the causes of disease; and yet, the modern history of the art of medicine could almost be written in its fullness from the records of the Anglo-Saxon race. We can claim almost every practical advance of the very first rank—vaccination, anæsthesia, preventive medicine and antiseptic surgery, the "captain jewels in the carcanet" of the profession, beside which can be placed no others of equal lustre.

One other lesson of Sydenham's life needs careful conning. The English Hippocrates, as I said, broke with authority. His motto was

> "Thou Nature art my Goddess; to thy law
> "My services are bound."

Undue reverence for authority as such, a serene satisfaction with the *status quo* and a fatuous objection to change have often retarded the progress of medicine. In every generation, in every country, there have been, and ever will be, *laudatores temporis acti*, in the bad sense of that phrase, not a few of them men in high places, who have lent the weight of a complacent conservatism to bolster up an ineffectual attempt to stay the progress of new ideas. Every inovator from Harvey to Lister has been made to feel its force. The recently issued life of Thomas Wakley is a running commentary on this spirit, against the pricks of which he kicked so hard and so

effectually. But there are signs of a great change. The old universities and the colleges, once the chief offenders, have been emancipated, and remain no longer, as Gibbon found them, steeped in port and prejudice. The value of authority *per se* has lessened enormously, and we of Greater Britain have perhaps suffered as the pendulum has swung to the other extreme. Practice loves authority, as announced in "the general and perpetual voice of men." Science must ever hold with Epicharmus that a judicious distrust and wise scepticism are the sinews of the understanding. And yet the very foundations of belief in almost everything relative to our art rest upon authority. The practitioner cannot always be the judge; the responsibility must often rest with the teachers and investigators, who can only learn in the lessons of history the terrible significance of the word. The fetters of a thousand years in the treatment of fever were shattered by Sydenham, shattered only to be riveted anew. How hard was the battle in this century against the entrenched and stubborn foe! Listen to the eloquent pleadings of Stokes, pleading as did Sydenham, against authority, and against the bleedings, the purgings and sweatings of fifty years ago. "Though his hair be grey and his authority high, he is but a child in knowledge and his reputation an error. On a level with a child, so far as correct appreciation of the great truths of medicine is concerned, he is very different in other respects, his powers of doing mischief are greater; he is far more dangerous. Oh! that men would stoop to learn, or at least cease to destroy." The potency of human authority among the powers that be, was never better drawn than by the judicious Hooker in his section on this subject. "And this not only with 'the simpler sort,' but the learneder and wiser we are, the more such arguments in some cases prevail with us. The reason why the simpler sort are moved with authority is the conscience of their own ignorance; whereby it cometh to pass that having learned men in admiration, they rather feared to dislike them than know wherefore they should allow and follow their judgments. Contrariwise with them that are skilful authority is much more strong and forcible; because they only are able to discern how just cause there is why to some men's authority so much should be attributed. For which cause the name of Hippocrates (no doubt) were more effectual to persuade even such men as Galen himself than to move a silly empiric."[1]

Sydenham was called "a man of many doubts" and therein lay the secret of his great strength.

Turning now to the main question of the development of this

[1] *Ecclesiastical Polity.* Book ii., vii. 2.

British medicine in Greater Britain, I must at once acknowledge the impossibility of doing justice to it. I can only indicate a few points of importance and I must confine my remarks chiefly to the American part of Greater Britain. We may recognize three distinct periods corresponding to three distinct waves of influence, the first from the early immigration to about 1820, the second from about 1820 to 1860, and the third from about 1860 to the present time.

The colonial settlements were contemporaneous with the revival of medicine in England. Fellow-students of Harvey at Cambridge might have sailed in the Mayflower and the Arbella. The more carefully planned expeditions usually enlisted the services of a well trained physician, and the early records, particularly of the New England colonies, contain many interesting references to these college-bred men. Giles Firman, who settled in Boston in 1632, a Cambridge-man, seems to have been the first to give instruction in medicine in the new world. The parsons of that day had often a smattering of physic, and illustrated what Cotton Mather called an "angelical conjunction." He says: "Even since the days of Luke, the Evangelist, skill in *Physick* has been frequently professed and practised by Persons whose more declared Business was the study of Divinity," Firman himself, finding physic 'but a meane helpe,' took orders. These English physicians in the New England colonies were scholarly, able men. Roger Chillingworth, in Hawthorne's *Scarlet Letter*, has depicted them in a sketch of his own life: "Made up of earnest, studious, thoughtful, quiet years, bestowed faithfully for the increase of knowledge, faithfully, too, for the advancement of human welfare,—men, thoughtful for others, caring little for themselves, kind, just, true, and of constant if not warm affections,"—a singularly truthful picture of the old colonial physician.

Until the establishment of medical schools, University of Pennsylvania, 1763; King's College (afterwards Columbia) 1767; Harvard, 1782, the supply of physicians for the colonies came from Great Britain, supplemented by men trained under the old apprentice system, and of colonists who went to Edinburgh, Leyden and London for their medical education. This latter group had a most powerful effect in moulding professional life in the pre-revolutionary period. They were men who had enjoyed not alone the instruction but often the intimate friendship of the great English and European physicians. Morgan, Rush, Shippen, Bard, Wistar, Hossack and others had received an education comprising all that was best in the period, and had acquired the added culture which can only come from travel and wide acquaintance with the world. Morgan, the founder of the medi-

cal school of the University of Pennsylvania, was away seven years, and before returning had taken his seat as a corresponding member of the French Academy of Surgery, besides having been elected a Fellow of the Royal Society. The War of Independence interrupted temporarily the stream of students, but not the friendship which existed between Cullen and Fothergill and their old pupils in America. The correspondence of these two warm friends of the colonies testifies to the strong professional intimacy which existed at the time between the leaders of the profession in the old and new worlds.

But neither Boerhaave, Cullen nor Fothergill stamped colonial medicine as did the great Scotchman, John Hunter. Long, weary centuries separated Harvey from Galen; not a century elapsed from the death of the great physiologist to the advent of the man in whose phenomenal personality may be seen all the distinctive traits of modern medicine, and the range of whose mighty intellect has had few, if any, equals since Aristotle. Hunter's influence on the profession of this continent, so deep and enduring, was exerted in three ways. In the first place, his career as an army surgeon, and his writings on subjects of special interest to military men, carried his work and ways into innumerable campaigns in the long French wars and in the War of Independence. Hunter's works were reprinted in America as early as 1791 and 1793. In the second place, Hunter had a number of most distinguished students from the colonies, among whom were two who became teachers of wide reputation. William Shippen, the first Professor of Anatomy in the University of Pennsylvania, lived with Hunter on terms of the greatest intimacy. He brought back his methods of teaching and some measure of his spirit. With the exception of Hewson and Home, Hunter had no more distinguished pupil than Philip Syng Physick, who was his house surgeon at St. George's Hospital, and his devoted friend. For more than a generation Physick had no surgical compeer in America, and enjoyed a reputation equalled by no one save Rush. He taught Hunterian methods in the largest medical school in the country, and the work of his nephew (Dorsey) on Surgery is very largely Hunter modified by Physick. But in a third and much more potent way the great master influenced the profession of this continent. Hunter was a naturalist to whom pathological processes were only a small part of a stupendous whole, governed by law, but which could never be understood until the facts had been accumulated, tabulated and systematized. By his example, by his prodigious industry and by his suggestive experiments he led men again into the old paths of

Aristotle, Galen and Harvey. He made all thinking physicians naturalists, and he lent a dignity to the study of organic life, and re-established a close union between medicine and the natural sciences. Both in Britain and Greater Britain he laid the foundation of the great collections and museums, particularly those connected with the medical schools. The Wistar-Horner and the Warren museums originated with men who had been greatly influenced by Hunter. He was, moreover, the intellectual father of that interesting group of men on this side of the Atlantic who, while practising as physicians, devoted much time and labour to the study of Natural History. In the latter part of the last century and during the first thirty years of this, the successful practitioner was very often a naturalist. I wish that time permitted me to do justice to the long list of men who have been devoted naturalists and who have made contributions of great value. Benjamin Smith Barton, David Hossack, Jacob Bigelow, Richard Harlan, John D. Goodman, Samuel George Morton, John Collins Warren, Samuel L. Mitchell, J. Aiken Meigs and many others have left the records of their industry in their valuable works and in the Transactions of the various societies and academies. In Canada, many of our best naturalists have been physicians, and collections in this city testify to the industry of Holmes and McCullough.

I was regretting the *humanities* a few minutes ago, and now I have to mourn the almost complete severance of medicine from the old natural history. To a man the most delightful recollections of whose student life are the Saturdays spent with a preceptor who had a Hunterian appetite for specimens—anything from a trilobite to an acarus—to such a one across the present brilliant outlook comes the shadow of the thought that the conditions of progress will make impossible again such careers as those of William Kitchen Parker and William Carmichael McIntosh.

Until about 1820 the English profession of this continent knew little else than British medicine. After this date in the United States the ties of professional union with the old country became relaxed, owing in great part to the increase in the number of home schools, and in part to the development of American literature. To 1820 one hundred and fourteen native medical books of all kinds had been issued from the press, and one hundred and thirty-one reprints and translations, the former English, the latter, few in number, and almost exclusively French (Billings).

Turning for a few minutes to the condition of the profession in Canada during this period, I regret that I cannot speak of the many interesting questions relating to the French colonies. With the

earliest settlers physicians had come, and among the Jesuits, in their devoted missions, there are records of *donnés* (laymen attached to the service), who were members of the profession. One of these, René Goupil, suffered martyrdom at the hands of the Iroquois.[1]

Between the fall of Quebec in 1759 and 1820, the English population had increased by the settlement of Upper Canada, chiefly by United Empire loyalists from the United States, and after the war of 1812 by settlers from the old country. The physicians in the sparsely settled districts were either young men who sought their fortunes in the new colony or were army surgeons, who had remained after the revolutionary war or the war of 1812. The military element gave for some years a very distinctive stamp to the profession. These surgeons were men of energy and ability, who had seen much service, and were accustomed to order, discipline and regulations. Sabine, in his "History of the Loyalists," refers to the Tory proclivities of the doctors, but says that they were not so much disturbed as the lawyers and clergymen. Still a good many of them left their homes for conscience sake, and Canniff, in his "History of the Profession in Upper Canada," gives a list of those known to have been among the United Empire Loyalists.

The character of the men who controlled the profession of the new colony is well shown by the proceedings of the Medical Board which was organized in 1819. Drs. Macaulay and Widmer, both army surgeons, were the chief members. The latter, who has well been termed the father of the profession in Upper Canada, a man of the very highest character, did more than anyone else to promote the progress of the profession; and throughout his long career his efforts were always directed to the proper channels. In looking through Canniff's most valuable work one is much impressed by the stirling worth and mettle of the old army surgeons who in the early days formed the larger part of the profession. The minutes of the Medical Board indicate with what military discipline the candidates were examined, and the percentage of rejections has probably never been higher in the history of the province than it was in the first twenty years of the existence of the Board.

One picture on the canvas of those early days lingers in the memory, illustrating all the most attractive features of a race which has done much to make this country what it is to-day. Widmer was the type of the dignified old army surgeon, scrupulously punctilious and in every detail regardful of the proprieties of life. 'Tiger' Dunlop may be taken as the very incarnation of that restless roving spirit

[1] Parkman. Jesuits in North America..

which has driven the Scotch broadcast upon the world. After fighting with the Connaught Rangers in the war of 1812, campaigning in India, clearing the Sangur of tigers—hence his soubriquet 'Tiger' lecturing on Medical Jurisprudence in Edinburgh, writing for Blackwood, editing the *British Press* and the *Telescope*, introducing Beck's Medical Jurisprudence to English readers, and figuring as director and promoter of various companies, this extraordinary character appears in the young colony as 'Warden of the Black Forest' in the employ of the Canada Company. His life in the backwoods at Gairbraid, his *Noctes Ambrosianæ Canadensis*, his famous 'Twelve apostles' as he called his mahogany liquor stand (each bottle a full quart), his active political life, his remarkable household, his many eccentricities—are they not all pourtrayed to the life in the recently issued *In the days of the Canada Company?*

Turning now to the second period, we may remark in passing that the 19th century did not open very auspiciously for British medicine. Hunter had left no successor, and powerful as had been his influence it was too weak to stem the tide of abstract speculation, with which Cullen, Brown and others flooded the profession. No more sterile period exists than the early decades of this century. Willan (a great naturalist in skin diseases) with a few others saved it from utter oblivion. The methods of Hippocrates, of Sydenham, and of Hunter had not yet been made available in every day work.

The awakening came in France, and such an awakening! It can be compared with nothing but the renaissance in the 16th and 17th centuries, which gave us Vesalius and Harvey. "Citizen" Bichât and Broussais led the way, but Lænnec really created clinical medicine as we know it to-day. The discovery of auscultation was only an incident, of vast moment it is true, in a systematic study of the correlation of symptoms with anatomical changes. Louis, Andral and Cheomel, extended the reputation of the French school which was maintained to the full until the sixth decade, when the brilliant Trouseau ended for a time a long line of Paris teachers, whose audience had been world wide. The revival of medicine in Great Britain was directly due to the French. Bright and Addison, Graves and Stokes, Forbes and Marshall Hall, Latham and Bennett were profoundly affected by the new movement. In the United States Anglican influence did not wane until after 1820. Translations of the works of Bichât appeared as early as 1802, and there were reprints in subsequent years, but it was not until 1823 that the first translation (a reprint of Forbes' edition) of Lænnec was issued. Broussais' works became very popular in translations after 1830, and in the journals from this time on

the change of allegiance became very evident. But men rather than books diverted the trend of professional thought. After 1825, American students no longer went to Edinburgh and London, but to Paris, and we can say that between 1830 and 1860, every teacher and writer of note passed under the Gallic yoke. The translations of Louis' works and the extraordinary success of his American pupils, a band of the ablest young men the country had ever seen, added force to the movement. And yet this was a period in which American medical literature was made up largely of pirated English books, and the systems, encyclopedias and libraries, chiefly reprints, testify to the zeal of the publishers. Stokes, Graves, Watson, Todd, Bennett and Williams, furnished Anglican pap to the sucklings, as well as strong meat to the full grown. In spite of the powerful French influence the text books of the schools were almost exclusively English.

In Canada the period from 1820 to 1860 saw the establishment of the English universities and medical schools. In Montreal the agencies at work were wholly Scotch. The McGill Medical School was organized by Scotchmen, and from its inception has followed closely Edinburgh methods. The Paris influence, less personal, was exerted chiefly through English and Scotch channels. The Upper Canada schools were organized by men with English affiliations, and the traditions of Guys, St. Bartholomew, St. Thomas, St. Georges, and of the London Hospital, rather than those of Edinburgh, have prevailed in Toronto and Kingston.

The local French influence on British medicine in Canada has been very slight. In the early decades of the century, when the cities were smaller, and the intercourse between the French and English somewhat closer, the reciprocal action was more marked. At that period English methods became somewhat the vogue among the French; several very prominent French Canadians were Edinburgh graduates. Attempts were made in the medical journals to have communications in both languages, but the fusion of the two sections of the profession was no more feasible than the fusion of the two nationalities, and the development has progressed along separate lines.

The third period dates from about 1860 when the influence of German medicine began to be felt. The rise of the Vienna school was for a long time the only visible result in Germany of the French renaissance. Skoda, the German Lænnec and Rokitansky, the German Morgagni, influenced English and American thought between 1840 and 1860, but it was not until after the last date that Teutonic medicine began to be felt as a vitalizing power, chiefly through the energy of Virchow. After the translation of the "Cellu-

lar Pathology" by Chance (1860) the way lay clear and open to every young student who desired inspiration. There had been great men in Berlin before Virchow, but he made the town on the Spree a Mecca for the faithful of all lands. From this period we can date the rise of German influence on the profession of this continent. It came partly through the study of pathological histology, under the stimulus given by Virchow, and partly through the development of the specialities, particularly diseases of the eye, of the skin and of the larynx. The singularly attractive courses of Hebra, the organization on a large scale in Vienna of a system of graduate teaching designed especially for foreigners and the remarkable expansion of the German laboratories combined to divert the stream of students from France. The change of alleigance was a deserved tribute to the splendid organization of the German universities, to the untiring zeal and energy of their professors and to their single-minded devotion to science for its own sake.

In certain aspects the Australasian Settlements present the most interesting problems of Greater Britain. More homogeneous, thoroughly British, isolated, distant, they must work out their destiny with a less stringent environment than, for example, surrounds the English in Canada. The traditions are more uniform and of whatever character have filtered through British channels. The professional population of native-trained men is as yet small, and the proportion of graduates and licentiates from the English, Scotch and Irish colleges and boards guarantees a dominance of Old Country ideas. What the maturity will show cannot be predicted, but the vigorous infancy is full of crescent promise. On looking over the files of Australian and New Zealand journals, one is impressed with the monotonous similarity of the diseases in the antipodes to those of Great Britain and of this continent. Except in the matter of parasitic affections and snake-bites, the nosology presents few distinctive qualities. The proceedings of the four Intercolonial Congresses indicate a high level of professional thought. In two points Australia has not progressed as other parts of Greater Britain. The satisfactory regulation of practice, so early settled in Canada, has been beset with many difficulties. Both in the United States and in Australia the absence of the military element, which was so strong in Canada, may in part at least account for the great difference which has prevailed in this matter of the state licence. The other relates to the question of ethics, to which one really does not care to refer, were it not absolutely forced upon the attention in reading the journals. Elsewhere professional squabbles, always so unseemly and distressing, are

happily becoming very rare, and in Great Britain, and on this side of the water, we try at any rate 'to wash our dirty linen at home.' In the large Australian cities, differences and dissensions seem lamentably common. Surely they must be fomented by the atrocious system of elections to the hospitals, which plunges the entire profession every third or fourth year into the throes of a contest, in which the candidates have to solicit the suffrages of from 2,000 to 4,000 voters! Well, indeed, might Dr. Batchelor, in his address at the fourth Intercolonial Congress, say: "It is a scandal that in any British community, much less in a community which takes pride in a progressive spirit, such a pernicious system should survive for an hour."

Of India, of "Vishnu-land," what can one say in a few minutes? Three thoughts at once claim recognition. Here in the dim dawn of history, with the great Aryan people, was the intellectual cradle of the world. To the Hindoos we owe a debt which we can at any rate acknowledge; and even in medicine, many of our traditions and practices may be traced to them, as may be gathered from that most interesting *History of Aryan Medical Science*, by the Thakore Saheb of Gondal.

Then there arises the memory of the men who have done so much for British medicine in that great empire. Far from their homes, far from congenial surroundings, and far from the stimulus of scientific influences, Annesley, Ballingall, Twining, Morehead, Waring, Parkes, Cunningham, Lewis, Vandyke Carter, and many others, have upheld the traditions of Harvey and of Sydenham. On the great epidemic diseases how impoverished would our literature be in the absence of their contributions! But then there comes the thought of 'the little done, the undone vast,' when one considers the remarkable opportunities for study which India has presented. Where else in the world is there such a field for observation in cholera, leprosy, dysentery, the plague, typhoid fever, malaria and in a host of other less important maladies. And what has the British Government done towards the scientific investigation of the diseases of India? Until recently little or nothing, and the proposal to found an institute for the scientific study of disease has actually come from the native chiefs! The work of Dr. Hankin and of Professor Haffkine, and the not unmixed evil of the brisk epidemic of plague in Bombay, may arouse the officials to a consciousness of their shortcomings. While sanitary progress has been great as shown in a reduction of the mortality from 69 per mille before 1857 to 15 per mille at present, many problems are still urgent, as may be gathered from reading Dr. Harvey's Presidential address and the proceedings of the Indian Medical congress.

That typoid fever can be called the "scourge of India" and that the incidence of the disease should remain so high among the troops point to serious sanitary defects as yet unremedied. As to the prevalence of venereal disease among the soldiers—an admission of nearly 500 per mille tells its own tale. On reading the journals and discussions one gets the impression that matters are not as they should be in India. There seems to be an absence of proper standards of authority. Had there been in each presidency during the past twenty years well equipped government laboratories in charge of able men, well trained in modern methods, the contributions to our knowledge of epidemic diseases might have been epoch-making, and at any rate we should have been spared the crudeness which is evident in the work (particularly in that upon malaria) of some zealous but badly trained men.

In estimating the progress of medicine in the countries comprising Greater Britain, the future rather than the present should be in our minds. The strides which have been taken during the past twenty years are a strong warrant that we have entered upon a period of exceptional development. When I see what has been accomplished in this city in the short space of time since I left, I can scarcely credit my eyes: the reality exceeds the utmost desire of my dreams. The awakening of the profession in the United States to a consciousness of its responsibilities and opportunities has caused unparalleled changes, which have given an impetus to medical education and to higher lines of medical work which has already borne a rich harvest. Within two hundred years who can say where the intellectual centre of the Anglo-Saxon race will be? The Mother Country herself has only become an intellectual nation of the first rank within a period altogether too short to justify a prediction that she has reached the zenith. She will probably reverse the history of Hellas, in which the mental superiority was at first with the colonies. At the end of the next century, ardent old-world students may come to this side 'as o'er a brook,' seeking inspiration from great masters, perhaps in this very city; or the current may turn towards the schools of the great nations of the south. Under new and previously unknown conditions, the Africander, the Australian or the New Zealander may reach a development before which even 'the glory that was Greece' may pale. Visionary as this may appear, it is not one whit more improbable to-day than would have been a prophecy made in 1797 that such a gathering as the present would be possible within a century on the banks of the St. Lawrence.

Meanwhile, to the throbbing vitality of modern medicine the two

great meetings held this month, in lands so widely distant, bear eloquent testimony. Free, cosmopolitan, no longer hampered by the dogmas of schools, we may feel a just pride in a profession almost totally emancipated from the bondage of error and prejudice. Distinctions of race, nationality, colour and creed are unknown within the portals of the temple of Æsculapius. Dare we dream that this harmony and cohesion so rapidly developing in medicine, obliterating the strongest lines of division, knowing no tie of loyalty but loyalty to truth—dare we hope, I say, that in the wider range of human affairs a similar solidarity might ultimately be reached? Who can say that the forges of Time will weld no links between man and man stronger than those of religion or of country? Some Son of Beor, touched with prophetic vision, piercing the clouds which now veil the eternal sunshine of the mountain top—some spectator of all time and all existence (to use Plato's expression)—might see in this gathering of men of one blood and one tongue a gleam of hope for the future, of hope at least that the great race so dominant on the earth to-day may progress in the bonds of peace—a faint glimmer perhaps of the larger hope of humanity, of the day when "the common sense of most shall hold a fretful world in awe." There remains for us, Greater Britains of whatsoever land, the bounden duty to cherish the best traditions of our fathers, and particularly of the men who gave to British medicine its most distinctive features, of the men, too, who found for us the light and liberty of Greek thought—Linacre, Harvey and Sydenham, those ancient founts of inspiration and models for all time in Literature, Science and Practice.

ADDRESS IN SURGERY.[1]

BY

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The Surgeon of Old in War.

I am indeed greatly honoured by having to deliver to you to-day an address in surgery. Fortunately for me the title is a wide one, and I shall take advantage of that fact to diverge from the strict consideration of surgical disease, and shall offer you instead a brief sketch of some of the most notable work done of old by a body of members of our profession who have never received their due reward—those, namely, who have devoted their lives to the succour of the sick and the wounded in war.

Military Surgeons in the Roman Army.

Twelve months ago my friend, Dr. Barnes, of Carlisle, ex-President of this Association, made me acquainted with a remarkable paper by the late Sir James Simpson, entitled Was the Roman Army provided with Medical Officers ?—a paper exhibiting such profound learning, so charmingly written, and so little known that I need not make any apology for acquainting you with some of its chief points of interest.

The most careful investigations have failed to make out from their writings whether the Romans regularly appointed physicians and surgeons to their armies or not, although nearly every other question relating to their military organisation has been treated of, sometimes very fully. Curiously enough, what little information we possess on the subject comes mainly from mortuary or from votive tablets. Borcovicus, in Northumberland—now called Housesteads—was one of the principal stations on the line of Hadrian's wall. Here, about seventy years ago, was found a monumental tablet, now in Newcastle Museum. On it is the following inscription :

D M	D(IIS) M(ANIBUS)
ANICIO	ANICIO
INGENUO	INGENUO
MEDICO	MEDICO
ORD COH	ORD(INARIO) COH(ORTIS)
I TUNGR	PRIMAE TUNGR(ORUM)
VIX AN XXV	VIX(IT) AN(NOS) XXV

[1] Read at the Annual Meeting of the British Medical Association at Montreal, September 2nd, 1897.

The First Tungrian Cohort is known to have been present at the battle of the Mons Grampius, and to have served at Castlecary, at Cramond near Edinburgh, in Cumberland, and at Housesteads. The tablet is highly ornamented, and antiquarians hold that a rabbit and round bucklers carved in the upper part, which are emblems of Spain, show that the young military doctor was probably a native of that country. From various works treating of Roman inscriptions Simpson was enabled to find that four more tablets, in which surgeons of cohorts are mentioned, existed. They were found at Rome. One of them is a votive tablet, the inscription upon which intimates that it was dedicated by Sextus Titius Alexander to Æsculapius and to the safety of his fellow soldiers. It was cut in the year of the consulship of F. Flavius Sabinus, which is known to have been A. D. 83. As the Roman legion consisted of ten cohorts, it is interesting to know that there were not only medical officers attached to each cohort, but also one attached to the legion—a sort of surgeon-colonel, as we should call him nowadays. Three tablets have been discovered in which the *medicus legionis* is mentioned. One found at Verona was a tablet raised by Scribonia Faustina to her dearest husband J. Caelius Arrianus, medical officer to the Second Italian Legion, who died at the age of 49 years and 7 months. Furthermore, Simpson rooted out of Mommsen's Latin inscriptions of Naples, a tablet, now in the Dresden collection, which was found in the Elysian fields near Baiâe, close to the Portus Julius, which was the station of a division of the Imperial fleet. The inscription tells that M. Satrius Longinus, *medicus duplicatorius* to the Trireme Cupid, and the heirs of those freed by Julia Veneria erected the tablet to the manes of that deserving lady. The term *duplicatorius* means that by reason of long or meritorious service he was entitled to double pay and rewards. These little gleanings from Simpson's paper show what an interesting one it is, and one is astonished at the labour that must have been expended in digging up the information contained in it.

Ambroise Paré.

Hundreds of years went past before there came upon the scene any military surgeon of note, but when he did appear he was a man of transcendent merit—the illustrious Ambroise Paré. From 1517 to 1590, for seventy-three years, he lived a long and incessantly active life, the contemporary of Vesalius, the immediate predecessor of Harvey. We have only time to glance at the soldier-surgeon side of Paré's life. For over thirty years he followed the wars under four kings of France—Henry the Second, Francis the Second, Charles the

Ninth, and Henry the Third, with intervals of a few years at home in Paris. Perpignan, Metz, Verdun, Rheims, Hesdin (where he was taken prisoner and had to write to his wife for his ransom), St. Quintin, La Fère, Amiens, the taking of Rouen, Dreux, Moncontour—these are but some of the bloody battles and sieges at which he was present. Through them all his humanity, his love of his profession, his independant character, and his jovial, frank disposition carried him safe, and made for the son of the poor country joiner warm friends among the greatest and noblest warriors of France. Even that miserable monster, Charles the Ninth, loved the Huguenot surgeon, and when the awful day of St. Bartholomew came, Paré was spared to tend his wretched master through the brief term of agonised and remorseful life that was given him. The description in Dumas's novel, the *Two Dianas*, of the wound of the famous warrior, Duke of Guise, where the lance entered above the right eye and came out between the nucha and the left ear, breaking short off, and how Paré lugged it out, with the chance that when it did come, one terrible gush of blood would finish his illustrious patient's life and his own career at the same moment—the picture of all this is real history.

Amid all the splendid work, both anatomical and surgical, which Paré did, the application of the principle of the ligature to bleeding arteries is of course that with which his name will be forever associated. In this day of grace it is impossible for us to imagine the horrors that awaited a wretched man so soon as his limb was cut off and the process of stopping the bleeding began. Think of the raw and exquisitely sensitive stump exposed to the red hot cautery or plunged into boiling pitch! For this frightful treatment Paré substituted the ligature, which in our own day, employed in the form of an aseptic animal material which the tissues quietly absorb, has practically reached the pitch of perfection. In his time, too, there was a fixed belief that the danger from gunshot wounds arose from the poison of the gunpowder conveyed on the bullet. To destroy this poison the treatment was to pour into the wound boiling oil in which elderwood bark had been stewed. On one occasion, not having this infernal concoction at hand, Paré used a cold mixture of yoke of egg, oil of roses, and turpentine to his wounded soldiers. He passed a sleepless night from dread that this would injure those to whom it had been applied, and his delight next day was proportionately great when he found that they had had but little pain, while their wounds were free from inflammation and swelling. This was his panacea for wounds ever afterwards. There are of course persons who wish to make out that he was not original in the matter of the ligature. He

himself says this about it; "Taught me as I interpret it by the suggestion of some good Angel, for I neither learnt it of my masters nor of any other man. And thus I wish all chirurgions to doe. For it is not in our Art, as it is in civill affaires, that prescription, law, or authority should prevail over right reason." But these cavillers have doubtless never heard of an ancient proverb which says that there is nothing new under the sun. In spite of them the world will ever believe in a glorious trio—Paré, the Frenchman, who invented the ligature; Morton, the American, who discovered anæsthetics; and Lister, the Englishman, who introduced antiseptics. In the fulness of years, possessed of affluence and surrounded by friends, died Paré, the whilom poor barber-chirurgeon, now a Councillor of State and Surgeon-in-Chief to the King. One final touch will perhaps reveal a sentiment that permeated and guided his every labour. On one occasion, after the successful treatment of a wounded officer, he made this wise and reverent remark, afterwards adopted as his motto: "*Je le pansay; Dieu le guarist*"—I treated him; God cured him.

Robert Clowes.

Coming to England, a surgeon who saw no little fighting was Robert Clowes, who was born somewhere about 1540 and died in 1604. He served in France in the army commanded by the Earl of Surrey, and was afterwards for several years in the navy. He then began practice in London, and was made surgeon to St. Bartholomew's and Christ's Hospitals. But after being about fourteen years in civil practice he was despatched by Queen Elizabeth's orders into the Low Countries to attend upon the Earl of Leicester, Commander of Her Majesty's forces. He was at Zutphen when Sir Philip Sydney was killed. His last piece of service was a glorious one, he being with our fleet that defeated the Spanish Armada. It is told of him that he always kept beside him his military surgical chest with the bear and ragged staff of his old chief Leicester on the lid. He finally settled down once more in London, where he was very successful in practice, and was made surgeon to the Queen. He wrote several works in English, of which the most important is entitled *A profitable and necessarie Booke of Observations for all those that are burned with the flame of gunpowder, &c., and also for curing of wounds made with musket, and caliver shot, and other weapons of war commonly used at this day both by sea and land.* A good half of this treatise is occupied with a record of surgical cases of note which he had treated, and this renders the work very entertaining inasmuch as we get an accurate and positive knowledge of everything that was

done for a wounded man in those days, while there are numererous little side touches very characteristic of life at the time it was written. He tells us, for instance, of "The cure of one Master Andrew Fones, a merchant in London, which, being in a ship at the sea was set upon by the Flushingers, in which fight he was very dangerously wounded with gunshot." There is "The Cure of Henry Rhodes, one of the waiters at the Custom House, he being upō the river of Thames a skirmishing with his peece, and by reason the peece had certain flaws in it, did break into many peeces, and made a great wound upon his chin, and carried away a good part of the manduble and the teeth withal; moreover, it did rend his hand greatly; all which I cured without maime or deformitie." There is "An observation for the cure of the master of a Hoy that had both his legs fractured and broken into many peeces with an iron bullet, shot out of a great basse or harquebusse of crocke at the sea by a Pyrat or sea rover." These few titles will give you an idea of Clowes's clinical cases. The importance which attaches to them, and the reason why they constitute a distinct advance in the science of surgery is that the author gives his actual experiences and tells us what he did to his patients, whereas at that period the tendency was to write endless commentaries on ancient writers, to whose every dictum the blindest and most unreasoning respect was paid.

Peter Lowe.

Contemporary with Clowes was a most interesting character—Maister Peter Lowe—who was born in Scotland about 1550, and lived some sixty or sixty-five years, reaching well into the seventeenth century. Like many of his countrymen, he went to France when very young, where he lived, for some say ten, some twenty years. Then he returned to Glasgow, where he lived and died a citizen of much renown, having obtained in 1599, from King James the Sixth a charter for the Faculty of Physicians and Surgeons of Glasgow, which he thus founded. A few years ago Dr. Finlayson published a most charming account of Maister Peter.

His most important work is termed *A Discourse of the whole art of chirurgery, compiled by Peter Lowe, Scottishman, Doctor in the Faculty of Chirurgerie at Paris, and ordinary Chirurgion to the French King and Navarre.* The first edition dated from 1597, and is one of the earliest, if not the very earliest, work embracing the whole art of surgery published in English. It is clear that Lowe must have seen a good deal of military service abroad, being "Chirurgion Major to the Spanish regiments two years at Paris, and since that time following the king of France my maister in the warrs." In

his day, as we have seen, the surgical world was still greatly exercised about gun-shot wounds and burning by gunpowder, as it was believed that they were injuries of quite a peculiar and very poisonous character. Lowe, however, treats of them with great good sense. Thus: "*Of Wounds done by Gun-shot.*—These wounds come indifferently to all parts of our body whereof there are divers opinions; some think that there is a venenosity in the powder, and burning in the bullet, which is false, for the things whereof the powder is ordinarily made, as Brimstone, Saltpeter, coales of divers sorts of trees, Water, Wine and Aquavitæ, have no venenosity in them; likewise there is no burning in the bullet, for if the bullet of lead being shot a great way, should burne, through heat would be melted itself. I have cured divers within these thirty yeares of divers nations which have followed the warres in Fraunce and other cuntries, in the which I have found no more difficulty than in any other contused wounds" Here, again, we have a most important advance made by a military surgeon for only those who are acquainted with the medical literature of Lowe's time can understand the ridiculous views then held about gun-shot wounds, and the dreadful consequences to the patients which followed from them.

We have seen that Paré lived between 1517 and 1590, and that Peter Lowe was in France between 1570 and 1580; consequently, he probably learnt all about the ligature for the arrest of hæmorrhage. When treating of amputations he describes the whole process of the operation up to the removal of the limb. Then he says: "One of the Assisters shall put the extremities of his fingers on the great vains and arteries to stay them from bleeding till the Chyrurgion either knit or cauterise them one after another. Where there is putrefaction we stay the flux of blood by Cauters actuals, and where there is no putrefaction, malignitie nor humour venomous we use the legator" He narrates the case of a certain valiant Captain Boyle of the Spanish troops whom he, in the capacity of Chyrurgion-Major to the regiment, was summoned to treat for an "aneurisme on the right side of his cragge." Lowe ordered it to be let alone, "but the captain sent for an ignorant Barbor who did open the swelling with a Launcet, which being done, the spirit and bloud came forth with such violence that the Captain died in fewe howers after." Having duly castigated the Ignorants who do such things, Lowe observes that his treatment for such cases is first to draw blood in both arms, and then to apply on the tumour "Rec, Pulveris subtilissimi boli arminici, sanguis draconis, myrtilorum, lapidis calaminaris in aceto extincti, absinthil ad unc. cum cerato refrigerantis Galeni quantum sufficit, fiat unguen-

tum." Curious to note how, even in men of distinct ability like Lowe a complete ignorance of pathology dragged them into the perpetration of the silliest empiricism.

Woodall's "Viaticum."

In 1628 appeared the first work in England specially devoted to military and naval surgery. Some eleven years later a second edition appeared, and this is its title—*Viaticum, being the Pathway to the Surgeon's Chest, containing chirurgical instructions for the younger sort of surgeons imployed in the service of his Majestie or for the Common-Wealth upon any occasion whatsoever intended for the better curing of wounds made by Gunshot,* by John Woodall. A perusal of the *Viaticum* shows that Woodall was a very practical surgeon and an eminently religious man, and the way in which he mixes up pills and piety is sometimes very diverting. After some excellent general advice to the surgeon's mate, including a warning against "being given and dedicated to the Pot and Tobacco-pipe in an unreasonable measure."—he enumerates the instruments for the Surgeon's Chest, including among others Catlings, Rasours Trapans, Trafine, Lavatories, Cauterising Irons, Storks bills, Ravens bills, Crowes bills, Terebellum, Probes or flamules, Glister Sirings and (what would have utterly damned his book in the present day) "one bundle of small German instruments." Then comes a list of medicines under the heading Unguentum, Aqua, Sol, Oleum, Chemicall Oyles, Syrups, Conserva, Electuariæ, and so on, winding up with a list of the Simples, and of the Herbs and Roots most fit to be carried. A long and careful description of the uses of the instruments and drugs follows, and then come chapters on wounds, apostumes, fractures, dislocations, amputation, scurvy, the plague, gangrene, and other topics. He observes that the cauterising irons had gone somewhat out of fashion, and he did not use them much himself "because of the feare they put the Patient into and for speech of people who are ready to scandalise an Artist upon each light occasion." In amputation, moreover, they are "now wholly forborne for reasons aforesaid, and for that a more pleasant course is known better for the patient and the Artist by making a ligature upon the veine, wound or artery, which is the binding of each end thereof, being first caught and holden with some fit instrument, and tied with a sure and strong thread."

Woodall advances the cure of wounds a distinct step, once more putting us under an obligation to the soldier-surgeon. This he does by sharply attacking all through his works the inordinate and meddlesome use of strong caustics. He says that he had seen men

lamed by the needless use of caustic medicines, even in slight wounds to which if an old wife had only applied her one salve for all sores, no such thing had happened. "They will not see a wound incarne and red and good flesh to grow, but straight they slander it of pride, and call it proud flesh, like their owne; and then must at the fairest Precipitate or Vitriale burnt goe to work, yea though the Patient be lame for it, or at the least the griefe put back again."

Richard Wiseman.

I wish I had time to give you a proper account of the adventurous life of Richard Wiseman, who has been termed the Father of English Surgery, and that not without reason. Born in 1620, dying in 1676, he lived in the time of Charles the First, of the Commonwealth, and of Charles the Second. He was a naval surgeon to begin with, serving in the early part of his life in the Dutch navy. Being, however, a devoted Royalist he served with the armies of Charles the First, and after his death went into exile with his son in France. He was present at the battle of Worcester, where he was taken prisoner, and afterwards confined in Lambeth House for awhile. During the Commonwealth he was naturally under a cloud, and even went off for three years to serve in the Spanish navy. At the restoration the King did not forget his old surgeon, who had done and suffered so much in his service, but appointed him his surgeon-in-ordinary, and afterwards serjeant-surgeon. The first edition of his work, printed in 1672, is quite a small book, and is entitled *A Treatise of Wounds*, but it afterwards expanded into a very large volume.

Nothing reveals a man like his own words, and so in trying to give you an idea of these old worthies I have let them tell their own stories. Wiseman believed in the need for giving stimulants to a man who was in the habit of taking them, if that man was in a dire strait. After describing the parlous case of a certain patient, it seems that the "man swooned and complained that he could not live without wine. I complied with his desire; he drank again as he pleased, his sickness went off, his wound digested, and he cured. This I have often seen in some of our Dunkirkers at sea, who drank extraordinarily, and were full of drink in our sea fights. I could scarce ever cure them without allowing them wine, and thereby their spirits were kept up, and I had the liberty to bleed them as I thought fit." From this it is clear that the old saying about Dutch courage has a distinct origin in fact. But if the unhappy Batavians were liable to be bled at once by the lance of the enemy and the lancet of the surgeon, one can hardly wonder at their taking something to keep their spirits up.

When speaking of gunshot wounds, he insists upon the bullet being searched for and extracted at once. "The part is at first dressing, with what diligence you can, to be cleared of all such Foreign Bodies as have made violent Intrusion into it, while the patient is warm with the heat of Battel, and the wound fresh and very little altered by either Air or Accidents, so that less pain must necessarily follow upon the extraction. In the *Armada Naval de Dunquerque*, where we Chirurgeons were oft employed in this Service, we after every fight went together visiting one another's wounded men. Amongst us it was thought a great shame if any of this work of Extraction was there to be done. It hath been the cause of the death of many a brave Souldier, and every Battel produces instances of it, to the discredit of our profession." This is good surgery and straight talk. I think it must have been a fine spectacle to have seen these rough old surgeons, with their limited knowledge and their miserable means of treatment, walking round to see each other's patients and learning how best to mend their mistakes.

He has a chapter entirely devoted to a great case of a fracture made by a splinter. The patient had his arm badly smashed above the elbow, and ought to have had it amputated ; but a sudden cry of fire stopped this. " I hastily clapt a dressing upon his arm and rouled it up, leaving his arm in his other hand to support it, and endeavoured to get up out of the hold as the others did, I verily believing I should never dress him or any of them more. But our men bravely quitted themselves of the Fire-ship by cutting the Sprizil Tackle off with their Hatchets (which they wore during fight sticking in their Shashes) ; we were freed of the fire, and by our hoisting up the top sails got free of our Enemy. Now, I was at a loss what to do with this man, who lay not far off complaining of his arm. I would have cut off his arm presently with a Razor (the Bone being shattered there needed no Saw) ; but this man would not suffer me to dress his arm ; he cryed ' it was already drest." The Fight over, we got into next Port ; I caused presently the Mariner's Bed to be set up (which was four pieces of wood nailed together and corded, and a Bear's skin laid upon it) ; this was fastened between two Guns to the Carriages." Wiseman then set hard to work to save this unfortunate mariner's arm ; but " when it came to my turn to be visited by my brother Chirurgeons of our Squadron, they did not dislike the wound nor my way of dressing (for we, being used to see one another's Patients, had all much one way of dressing) : but they laught at the excuse I made for not cutting of his arm, and doubted I should yet be forced to do it. But at the end of two months there was in this Patient a strong

callus, filling up the void place of the lost Bone at least two inches, with little or no shortening of the arm." Well done, Wiseman!

Baron Larrey.

Up till the time of the French Revolution it is clear that military surgeons were not men of much importance, and probably had very little influence, if any, in the conduct of campaigns. But in the latter part of last century war was made on a scale which was never known before, and was made also with a rapidity and a precision quite unprecedented. Moreover, the science and art of surgery had been rescued from quackery, and surgeons in actual practice were able to be of great and real service to the wounded. As a result of the vast masses of men that were hurled against each other, the number of wounded after a big battle amounted to thousands, and civilization had so far advanced that it was imperative that immediate help should be given to them. So that about this time the military surgeon really became an important officer in warfare, and began to have his rank and pay well defined, and his merits (up to a certain point) recognised.

In 1776, near the Pyrenees, was born Jean Dominique Larrey, the Chirurgien-en-Chef de la Grande Armée, the friend and body surgeon of Napoleon, the greatest military surgeon that ever lived. He studied at the medical school of Toulouse, and in 1792 joined the headquarters of the Republican Army of the Rhine under Custine. Now, the ambulances of these days were obliged to remain about a league from the army, and the wounded were only picked up after the fighting was done. General Custine was a man who moved his troops very rapidly, which made matters worse for the wounded. This greatly affected Larrey, who set to work and devised a new ambulance hung on springs, and combining great strength and lightness. Such carriages were termed *ambulances volantes*. They could keep up with the advanced guard of the army with the speed of flying artillery, and they carried off the wounded almost as they fell. Larrey had early perceived the enormous advantage a wounded man got by having his fracture set or his bleeding stopped as rapidly as possible, and by then getting a roof over his head before night set in. General Beauharnais, in a despatch to the Convention, made special mention of "Surgeon-Major Larrey and his comrades with flying ambulances, whose indefatigable care in the healing of the wounded has diminished those afflicting results to humanity which have generally been inseparable from days of victory, and has essentially served the cause of humanity itself in preserving the brave defenders of our

country." The staff of a flying ambulance was about 340 in number For each division there were four heavy carriages and twelve light ones. Some had two and others four wheels, and they were furnished with mattresses. In Napoleon's Italian campaigns they came greatly to the fore, and the great man displayed a lively interest in them, reviewing them and causing them to manuœvre before him just as if they were on a battle field. After one of these inspections he said to Larrey: "Your work is one of the most happy conceptions of our age. It will suffice for your reputation."

When Napoleon undertook his Egyptian campaign Larrey proceeded to Toulon to organize the medical staff. So readily did professional men respond to the call made by him that he soon was able to reckon on 800 well qualified surgeons, of whom many had served in the army of Italy, and these were in addition to the medical officers actually attached to regiments. This, I think, shows the value that the king of commanders set upon the health of his troops, and the trouble and expense which he was prepared to face in order to maintain it—a great contrast to the miserable way of dealing with this subject, which has too long been the fashion with our military rulers. Not long after the landing at Alexandria a certain General Figuières was severely wounded. By able treatment, he recovered, and in gratitude for the preservation of his life he asked Napoleon to accept a valuable Damascus sword. "Yes," said the latter, "I accept it in order to make a present of it to the Surgeon-in-Chief by whose exertions your life has been spared." Upon the sword was engraved the words Aboukir and Larrey, and the surgeon had it till the fatal day of Waterloo, when the Prussians robbed him of it. Some months after the occupation of Egypt a terrible revolt took place in Cairo by fanatical Turks. Utterly regardless of anything except how to get at Frenchmen to murder them, they attacked the hospital, which was crowded with sick and wounded soldiers, but the doctors valiantly defended their patients, and two staff-surgeons, Roussel and Monjin, were killed while Larrey nearly shared the same fate.

At one period there was a total dearth of meat, and Larrey had nothing wherewith to make even a drop of bouillon for his patients. He ordered camels' meat to be prepared for this purpose, and, when that fell short, he used up the horses. Years afterwards, in the second campaign against Austria, the Imperial Guard and several other corps were crowded together in the island of Lobau in the midst of the Danube, which Napoleon was endeavouring to cross. The days were roasting, and the nights icy cold, and provisions became so scarce that Larrey's patient's were in danger of starvation. Without

more ado he impounded certain officer's horses and had them slaughtered and employed as food. As there was a lack of kettles, he employed the cuirasses of those who had been killed, and made his horse flesh soup and stews in them. Certain generals made bitter complaint to the Emperor of Larrey's proceedings, who summoned the Surgeon-in-Chief, and in the presence of his staff demanded an explanation with a severe expression of countenance. "What," he said, "have you on your own responsibility disposed of the horses of the officers in order to give soup to your wounded?" "Yes," answered Larrey. He added no more, but soon afterwards he heard of his promotion to the rank of Baron of the Empire.

One of the most appalling retreats, next to that from Moscow, was Napoleon's retreat from the invincible walls of St. Jean d'Arc through Jaffa. There is no doubt that at that place a considerable number of patients sick of the plague were quietly put out of their misery by opium. Alison says 60; Sir Robert Wilson says 580. The retreat had to go on, the Turks were only an hour's march behind, and nothing but a cruel death awaited these unfortunates, so that whether this were a justifiable deed or not may well give ground for argument. But, as Alison says: "History must record with admiration the answer of the French chief of the medical staff when the proposal was made by Napoleon to him: 'My vocation is to prolong life, and not to extinguish it.'"

In those days means of transport were so inferior, and the necessity for removing hopelessly damaged limbs as soon as possible after the injury so imperative, that amputations were performed on the field of battle, while it was still raging and amid showers of bullets. During the battle produced by the landing of the English in Aboukir Bay, General Silly had his knee crushed by a bullet. Larrey saw that unless the leg were promptly amputated the case would prove fatal, and, the General giving his consent, the operation was performed in the space of three minutes under the enemy's fire. Just then the English cavalry came upon them. "I had scarcely time," said Larrey, "to take the wounded officer on my shoulders and to carry him rapidly away towards our army, which was in full retreat. I spied a series of ditches, some of them hedged with caper bushes, across which I passed, while the enemy, owing to the ground being so cut up, had to go by a more circuitous route. Thus I had the happiness to reach the rearguard of our army before this corps of dragoons. At length I arrived at Alexandria with this honourably wounded officer, where I completed his cure." We must all agree that these were a pair of heroes.

As may be imagined, the awful retreat from Moscow called into play all Larrey's resources, and many an interesting story could be told of his efforts. Think of the awful battle of the Borodino, where under Larrey's own direction 200 amputations were performed, where there were neither couches nor blankets nor covering of any kind, and where the food consisted of horseflesh, cabbage stalks, and a few potatoes ; think of cold, so intense that the instruments requisite for the operation too often tumbled from the powerless hands of the French surgeons. Think of the savage Cossacks, hovering about all the while, and waiting their chance to kill the surgeon and wounded man equally with the combatant. Then came the passage of the Beresina. Take an incident of it. Among the wounded was General Zayonchek, who was over 60 years of age. His knee was crushed, and without amputation the saving of his life was impossible. It was performed under the enemy's fire, and amid thick falling snow. There was no shelter except a cloak, which two officers held over him while the operation was being performed ; but the surgeons did their work, with such coolness and dexterity that the old general survived, and died fourteen years afterwards Viceroy of Poland. Larrey succeeded in getting over the Beresina with the Imperial Guard, but discovered that the requisites for the sick and wounded had been left on the other side. At once he recrossed the river, only to find himself in the midst of a furious struggling crowd. He was on the point of being crushed to death when providentially the soldiers recognised him. No sooner did they do so than they carried him across the river in their arms, with the cry, "Let us save him who saved us!" and forgot their own safety in their desire to preserve the man whose tender kindness they had so often experienced.

Following his adored master through victory and defeat, Larrey at last stood at night on the field of Waterloo alone, except for some medical officers and the wounded who lay groaning around him. Down upon them came a squadron of Prussian lancers. Expecting no quarter he fired his pistols at them and galloped away. They shot his horse and sabred him as he lay on the ground. Leaving him apparently dead they went off. But he recovered his senses, and tried to crawl by cross roads into France. Again he was seized by another detachment of Prussian cavalry. They robbed him promptly of all he possessed, and took him before a superior officer, who ordered him to be shot. What a reward from a soldier to one whose life had been passed in succouring soldiers! About a quarter of an hour before the sentence was to be carried out, a surgeon-major recognized Larrey. He had attended with deep interest a course of lectures

which Larrey had delivered in Berlin six years previously. The prisoner was brought before Bulow, and finally presented to Blücher, whose son in the Austrian campaign had been badly wounded and captured by the French, and who owed his life to Larrey's exertions.

Larrey's honourable and glorious life terminated in 1842. Napoleon, when he made his will at St. Helena, wrote in it : " I bequeath to the Surgeon-in-Chief of the French Army, Larrey, 100,000 francs. He is the most virtuous man I have ever known." From Napoleon's lips the word's of free spontaneous, ungrudging praise such as this rarely fell.

Pestilence more Deadly than the Sword.

In the middle of last century, while surgery had distinctly improved, the gross neglect of the Government, and the pigheaded obstinancy of the generals was such that our unfortunate soldiers and sailors were hardly any better off than they were in the days of Paré. It has been maintained that Smollett, in the appalling picture of naval life as witnessed in the miserable expedition to Carthagena which he drew in *Roderick Random*, and which is known to have been the record of his own experience as a surgeon's mate, grossly exaggerated the evils thereof. I do not believe this. Look at the awful and unsuccessful expedition to Porto Bello in 1726, when nearly the whole of the crews of the ships were destroyed by fever three times over ; where 2 admirals, 10 captains, 50 lieutenants, and about 3,000 to 4,000 inferior officers and men perished without striking a blow. Look at the taking of Havannah in 1762. The Earl of Albemarle took with him in the fleet 11,000 soldiers. Between June and the middle of October, when Cuba was ours, we had lost 560 by wounds, and 4,708 by sickness. At the end of the Seven Years' War, a statement was drawn up in the *Annual Register* for 1763, from which it appeared that in all the naval battles of that war there were but 1,512 sailors and marines killed, while 133,738 had died of disease or were " missing." Look even at the end of last century, and consider the wretched and disgraceful Walcheren campaign. Never did our poor soldiers fight with more gallantry than in that campaign, only to perish beside Dutch ditches and canals from fever and ague and dysentery.

Military Courage.

As we have just seen, Baron Larrey's whole life shows that, while absolutely devoted to the work of his profession, he displayed a cool courage on the field of battle not less heroic than the dazzling deeds of his fellow combatant officers. Not less does it mark the military surgeon of the present day. Have you ever heard of Surgeon Thom-

son who, during the Crimean war, when the army marched off after the battle of the Alma, volunteered, with his servant, John McGrath, to remain behind on the open field with 500 terribly wounded Russians, and passed three awful days and nights—these two Englishmen alone—among foreign foes, some dead, some dying, and none able to raise a hand to help themselves? Have you ever heard of Assistant-Surgeon Wolseley, of the 20th Regiment, who, at the battle of Inkerman, had quietly established his field hospital in that awful place, the Sandbag Battery? When the 150 men, who were all that remained of its defenders, were forced to desert it, about 100 of them fell back in one direction, and in that they found, at 30 paces from them, a Russian battalion blocking their path. There was not a combatant officer left, so the assistant-surgeon took command. He had not even a sword with him, but, laying hold of a firelock with a fixed bayonet on it, he spoke a few words to the men within range of his voice, and told them that what they now had to fight for was not victory but life. Then he gave them the word of command: "Fix bayonets, charge, and keep up the hill." The soldiers answered him with a burst of hurrahs, sprang forward to the charge, and the next instant were tearing through the thickest of the Russians. One half of these reached the other side alive. Have you ever heard of Surgeon Landon, who was shot through the spine while attending to the wounded on Majuba Hill? His legs were paralysed, but he caused himself to be propped up, and continued his merciful work till his strength ebbed away. When unable to do more he quietly said: "I am dying; do what you can for the wounded." Have you ever heard of Surgeon-Captain Whitchurch, who gained the Victoria Cross at the beleaguering of Chitral for the most determined courage in endeavouring to save the life of Major Baird; Yes, you have, for last year at Carlisle, you gave him the gold medal of the Association, the highest honour which our Association can give to its members. There died the other day a certain Surgeon-General Reade, C.B., V.C. During the seige of Delhi, while attending to the wounded at the end of one of the streets of the city, a party of rebels advanced from the direction of the bank, and having established themselves in the houses in the street commenced firing from the roofs. The wounded were thus in very great danger, and would have fallen into the hands of the enemy had not Surgeon Reade drawn his sword and, calling upon a few soldiers who were near, to follow, succeeded under a very heavy fire in dislodging the rebels from their position. Surgeon Reade's party consisted of about ten in all, of whom two were killed and five or six wounded. Ladies and gentlemen, Surgeon Reade was a Cana-

dian, and the son of a colonel of the Canadian Militia. Of the 118 wearers of the Victoria Cross 14 are surgeons, nearly 12 per cent. of the whole number. They stand in the proportion of 9½ per cent. of all the officers of the army, so at all events they have contributed not less than their fair share of the deeds of valour which alone can win that glorious distinction.

The Army Medical Service To-day.

Ladies and Gentlemen,—I have diverged from the beaten track common to the givers of addresses such as this to tell you what splendid men have been the military and naval surgeons of old, who not merely did their duty nobly and courageously as such, but who have in their day enormously contributed to the advance of the art of surgery. I have done it with a purpose ; with the hope of attracting more strongly than ever the sympathy and help of this great Association to their military brethren in a critical juncture of their history. To-day Her Majesty's Government cannot induce candidates to come forward for the medical service of the Queen's army. And why ? Because it has persistently treated the Army Medical Department meanly and shabbily. To-day the Government of India can secure the services of the pick of our newly fledged doctors for its army. And why ? Because it has always treated the Indian Medical Service liberally and generously. I am not going to enter into the reasons for this ; I desire to emphasise one point, namely, that money is not at the bottom of this difficulty. The soldier-surgeons of to-day are the same men now that they were in the days of William Clowes, who winds up his book, as I shall my address, with these verses :

> When valiant Mars, with brave and warlike band,
> In foughten field with sword and shield doth stand,
> May there be mist a surgeon that is good,
> To salve your wounds and eke to stay your bloud.
>
> To cure you sure he will have watchful eie,
> And with such wights he means to live and die,
> So that againe you must augment his store,
> And having this he will request no more.

PREVENTIVE MEDICINE IN THE CITY OF NEW YORK.[1]

BY

HERMANN M. BIGGS, M.D.,

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I desire to express my high appreciation of the honour conferred upon me by the invitation of the Council of the British Medical Association to deliver the address on Public Medicine at its annual meeting, and for this I wish to render my grateful acknowledgment.

I interpret the invitation, however, as a tribute to the work of the Health Department of New York city, with which I have had the honour to be connected for many years, and as an expression of the desire of the Council to give recognition to the practical advances made in sanitary science in the greatest city of the new world. I have, therefore, regarded your invitation as a command to select for the subject of this address the consideration of some of the measures which have more particularly distinguished the work of the New York City Health Department, and to describe some of the procedures, followed in the sanitary surveillance of infectious diseases, which have been introduced by it.

I feel a great diffidence in presenting an address dealing with these subjects before the British Medical Association, representing, as it does, the medical profession, and, to a great extent, the health officers of a country which has been so long and justly regarded as the birth-place and home of sanitary science. It has been the custom of sanitarians of all nations to look to England for guidance and direction in matters connected with the public health, and the low mortality statistics, especially from zymotic diseases, in England testify in no uncertain language to the value of English sanitary methods and the efficiency of their execution. When we remember that never before in the world's history have there been 30,000,000 people living within 50,000 square miles, as is the case in England, and that more than 20,000,000 of this population reside in towns, often crowded, we appreciate more fully the remarkable healthfulness of the England of to-day and the extraordinary success of English sanitation, as of English methods in all the practical affairs of life.

[1] Read before the British Medical Association, Montreal, September 3rd, 1897.

The fact should be strongly emphasized that the advances in preventive medicine in Great Britain, as shown by the mortality tables for nearly half a century, have preceded those in every other country, and I doubt not that the influence of the British Medical Association has been no small factor in contributing to the high standard of the public health. In view of these considerations, it is natural that a foreigner should hesitate to address this Association on questions connected with public medicine.

I must further ask your indulgence in having devoted the greater part of this address to the study and description of procedures and methods, rather than, as is generally the custom, to the consideration of some one of the broader questions in public medicine. This course has been adopted because, in my judgment, such a discussion will be of greater value and interest than the consideration of any general topic, which latter could furnish little specific information as to the conditions and methods of sanitary work in the United States.

It seems necessary, in order that you may have an intelligent conception of the conditions under which sanitary work in the United States is carried on, that I should first point out, in a general way, how they differ from those in Great Britain. It should be noted particularly that in the United States there is no national board of health, and there are no national regulations of general application. In each of the several states of the Union the sanitary administration is solely under the control of the State authorities. The State Boards of Health are energetic and progressive in many of the States, but in some there is no sanitary work of importance done.

It necessarily follows that throughout the United States there is a great lack of uniformity in regulations and methods and in the efficiency of their execution. It is hardly possible to make any definite statement as to the condition of preventive medicine generally, for what is true of one State is not true of another. Speaking broadly, in the rural districts and in the towns and smaller cities, especially in the south and west, the sanitary methods are of the crudest type. On the other hand, in many of the large cities, there is found a broad, enlightened and progressive policy and an efficient administration, equal to that presented in any of the great cities of the world.

Instead, therefore, of attempting the consideration of the broader subject of public medicine in the United States, I shall confine myself to a discussion of the conditions and methods of sanitary work in New York, as these serve as a type of the best of those found in the greater American cities.

The Health Department of New York City is organized under a special act of the Legislature of New York State, and is an entirely independent sanitary organization, not being subject even to the jurisdiction of the State Board of Health. The Board of Health of the Health Department is composed of four members, viz.: The President, who is the chief executive officer; the Commissioner of Health, who must be a physician, (these two being appointed by the Mayor of New York City), and two *ex officio* members—the Health officer of the Port of New York (who is a state officer nominated by the Governor), and the President of the Board of Police Commissioners of New York City (the latter being added to bring the Police Department and the Health Department in closer relations to one another). The Commissioner of Health of the Health Board of New York City is *ex officio*, a member of the State Board of Health, as is also the Health Officer of the Port of New York; so that two of the members of the Municipal Board are also members of the State Board of Health, but the State Board has no jurisdiction in New York City, and the action of the Municipal Board is absolutely independent.

The Board of Health of New York City has jurisdiction over the whole of New York City, as it now exists, with its about 2,000,000 of population, and with the beginning of 1898 a similar Board, increased to five members, will have complete jurisdiction over greater New York, with a population of about 3,250,000. All of the administrative and executive work of the Department is concentrated at the main offices, and is carried on under the immediate direction of the chiefs of the various divisions into which the Department is divided. The act of the Legislature of New York State creating the Department gives to the Board most ample powers, executive, judicial and legislative in character. The funds for the support of the Department are supplied from the general funds of New York City.

Before proceeding to a discussion of the management of infectious diseases in New York, I desire to call especial attention to the fact, that all matters connected with the scientific investigation, diagnosis, care or sanitary supervision, in every way, of the infectious diseases are regarded by the Board of Health as properly coming within its province. In the development of the methods, now in use, the proposition expressed has furnished the governing principle. I need hardly point out the great difference between this conception of the functions of a Sanitary Board and that usually held.

The duties of sanitary authorities relating to the infectious diseases are generally regarded as limited to the inspection of reported cases

of only a few of the infectious diseases, their removal to hospitals when required, and the subsequent proper disinfection of the premises.

In times of emergency, as in the presence of serious epidemics, more comprehensive and stringent measures are considered justifiable; but it has not been generally regarded as necessary or desirable that municipal sanitary authorities should furnish opportunities for or assistance in the diagnosis of infectious diseases, should conduct experimental investigations into their causes, should assist in the treatment in any way of cases outside the hospitals, or otherwise concern themselves with these matters. It has seemed to us in New York City, however, that everything connected with the infectious diseases in every form came properly within the scope of the department's work.

The first important departure in New York City from the older methods, was made in 1892 by the establishment of a bacteriological laboratory. This was, I believe, the first bacteriological laboratory ever established under municipal control. It was designed originally to afford facilities for the bacteriological diagnosis of Asiatic Cholera, and for the investigation of questions relating to disinfection and disinfectants. A few months after the opening of the laboratory, the scope of its work was broadened and facilities for the bacteriological diagnosis of diphtheria were offered to the physicians of New York City free of charge. The necessity for making repeated examinations during the course of this disease soon became evident, and such changes were made by the Health authorities in the methods of dealing with diphtheria as were suggested by the earlier experimental observations.

The investigations of the New York City Health Department relating to diphtheria laid the foundation of municipal bacteriological laboratories and made them necessary to the proper conduct of sanitary work.

The work on diphtheria was soon followed by the perfecting of arrangements for the free bacteriological examination of sputum for the diagnosis of cases of suspected tuberculosis occurring among residents of New York city.

In October, 1894, investigations in connection with the production of diphtheria antitoxin were begun, and in December of that year the municipal authorities made a special annual appropriation (antitoxin fund) of $30,500 for the prosecution of this work. The Health Department commenced the use of the antitoxin produced in its own laboratories on January 1st, 1895. The plan, as now developed, includes :

1st: The furnishing of free supplies of diphtheria antitoxin to all public institutions in New York city.

2nd. The furnishing of free supplies of diphtheria antitoxin to private physicians for use among persons too poor to pay for the remedy; the only condition being that reports of the cases treated be forwarded to the Health Department on their completion.

3rd. The free administration of diphtheria antitoxin on the request of the attending physician to any resident of New York city by a specially detailed staff of medical inspectors.

The sale of the surplus product of diphtheria antitoxin was authorized by a special act of the New York State Legislature in 1895, and the funds thus derived, according to the provisions of this act, are devoted solely to "the production and use of diphtheria antitoxin, or other antitoxins." The remedy is on sale in over 100 pharmacies in the city, to which it is consigned, the price being fixed by the Health Department in all cases, and ten per cent. on the sales is allowed to the pharmacies as commission.

The special antitoxin fund made possible the establishment of a hospital and research bacteriological laboratory devoted to the production of diphtheria antitoxin and other bacteriological products and to general experimental investigations in relation to the infectious diseases. The work of this laboratory now includes the production of tetanus and streptococcus serums, mallein and tuberculin (used by the Department in the diagnosis respectively of glanders and tuberculosis in animals) and numerous experimental investigations regarding the infectious diseases, especially diphtheria, typhoid fever, tuberculosis and small pox.

In October, 1896, arrangements were completed for placing at the command of the physicians of New York city Widal's test for the diagnosis of typhoid fever, largely after the method of Wyatt Johnston, of Montreal, and recently arrangements have also been made for the administration of Pasteur's treatment for the prevention of rabies.

A better idea, perhaps, of the extent of the work performed in the laboratories of the Health Department of New York city may be obtained from the following statistical statement of some of the routine work:

During the year 1896, 25,049 cultures were examined for diphtheria bacilli; 1,856 specimens of sputum from cases of suspected tuberculosis were examined for tubercle bacilli; 16,796 vials of diphtheria antitoxin were issued, 918 cases of diphtheria were treated in their homes by the medical *attachés* of the laboratory, and 1,214 persons were immunized.

The scientific staff of the bacteriological and vaccine laboratories now includes twenty-five physicians, one chemist and two veterinarians, in addition to clerical and laboratory assistants and attendants.

A special laboratory and stable are devoted to the production of bovine vaccine virus, and this is freely distributed and vaccination is performed free of charge by the medical officers of the Department. Special investigations undertaken in this laboratory have resulted in the production of a glycerinated vaccine pulp of great activity and durability, This has entirely displaced the virus prepared by drying on quills or ivory points generally employed.

The work connected with disinfection was formally in charge of the Director of the Bacteriological Laboratories, and the methods employed are still determined in the laboratories, but the details of execution, however, are now entrusted to the Chief Inspector of Contagious Diseases.

Every case of contagious disease reported to the department is regularly inspected by the Medical Inspector assigned to the district in which it occurs. When consent can be obtained, such cases are removed to the department hospitals. In tenement house districts an effort is made to induce a patient suffering with a contagious disease to go to the hospital, and where the conditions are such as to require it, and when necessary, the removal to the hospital, is enforced. A comparatively small proportion of the total cases, however, are actually treated in the hospitals for contagious diseases. After completion of the illness, or transfer of the patient, thorough disinfection is performed in the apartment, and all infected materials are removed to the disinfection station for destruction, or for disinfection by steam. After treatment they are returned to the owner, no charge being made for the services. Disinfection is compulsory in every case.

The inspection work of the Health Department is carried on by a number of different corps of inspectors attached to the various divisions of the department. These inspectors are in part medical men, and in part they are non-medical men, who have had special training in the work to which they are detailed. The medical corps include the district medical inspectors; the district and special vaccinators; the inspectors for the administration of diphtheria antitoxin; the diagnosticans; the summer corps of inspectors; the medical inspectors of schools; the veterinary inspectors, and several special inspectors of disinfection of lodging houses, and public institutions. These various corps, with the exception of the summer corps and the school inspectors, are permanent and are on duty throughout the year. The school inspectors are on duty only through the school year, and the

work of the summer corps is limited to July and August. There are also a number of corps of sanitary and food inspectors, (not necessarily medical men) and the disinfection corps. These include the inspectors of plumbing and ventilation; the sanitary police; the inspectors of offensive trades; the inspectors of meat, fish, milk and food; and the inspectors of mercantile establishments.

The functions of most of these different corps are, for our purpose, sufficiently indicated by the name. It may be here added, however, that, under the law creating the corps of inspectors of mercantile establishments, definite provisions are made as to employment of women and children in such establishments, and as to the time, nature, and condition of such employment.

It should, perhaps, also be stated that the function of the diagnosticians, two of whom are always on duty day and night, is to give expert assistance in the *clinical* diagnosis of contagious diseases. It is a part of their duty to see every case of contagious disease before its admission to the department hospitals.

The veterinary inspectors have supervision of the application of the tuberculin test for the diagnosis of tuberculosis in cattle, and the diagnosis of other infectious diseases of cattle and horses.

I desire now to present somewhat in detail the methods of procedure in relation to two diseases, viz., diphtheria and tuberculosis, as in these diseases the methods have been developed to an unusual extent in New York.

Knowledge of the existence of cases of diphtheria reaches the department, either by a direct report of the case by the attending physician, or through the forwarding of a culture to the laboratory for bacteriological examination, when the case is of doubtful character. If on examination of the culture the Loeffler bacilli are found, the case is reported to the Division of Contagious Diseases from the laboratories, at the same time that a report is forwarded to the attending physician. In both instances the cases are immediately referred to the Medical Inspector connected with the Division of Contagious Diseases assigned to the district in which the case occurred. If the person lives in a tenement house, lodging house, boarding house, or hotel, and a culture has not been previously made by the attending physician, the Inspector makes, in each instance, a culture to confirm the diagnosis. The subsequent action of the department depends upon the result of this culture. If diphtheria bacilli are found, the case is treated as one of diphtheria; if they are absent, the subsequent treatment depends on the special conditions existing. In every instance in which the case is proven to be diphtheria, at the

end of ten days a secondary culture is made by the attending physician or the District Medical Inspector, to determine whether the diphtheria bacilli are still present in the throat, and subsequent cultures are made at short intervals until the examinations show that the organisms are no longer present. The case is then referred for disinfection, a detailed statement being left at the house by the Medical Inspector in charge, to guide the disinfectors as to the course which shall be followed.

Every case of diphtheria which comes to the knowledge of the Department is recorded in a card index, according to the number of the house and the street on which it occurs. In this index envelopes are used in place of cards, and in each envelope, representing always one case, are placed all of the data relating to the first and subsequent cultures, and results, and as each case is recorded it is at the same time plotted on a sectional map of New York City drawn to scale, showing every house lot in the city. This platting is done by conventional signs, so that it is possible at a glance to determine the grouping and distribution of cases in different parts of the city ; the number of cases occurring in any given house in the city, during the last four years since this method has been in use, and the date when reported. It is also possible in a moment, by reference to the yearly card index, to find all the information in relation to each case which the Department possesses.

A special corps of inspectors is assigned to the administration of diphtheria antitoxin, and on request, one of these inspectors will visit a person suffering from diphtheria in any part of the city, day or night, and administer diphtheria antitoxin, under the supervision of the attending physician. When the patients are too poor to have an attending physician, the inspectors will supervise their removal to the hospitals. These inspectors are also prepared, at the request of the attending physician, to perform intubation in laryngeal diphtheria. It is the usual course, where antitoxin is administered by an inspector, to imunize all members of the family who have been exposed to the disease. Diphtheria antitoxin has also been largely employed for the immunization of the inmates of public institutions, especially children, when diphtheria has appeared. This is the ordinary routine, and in every instance during the last two-and-a-half years it has been possible to quickly stamp out diphtheria in institutions by this process of immunization.

As already stated, diphtheria antitoxin is furnished on request free of charge to all public institutions, and may be obtained by physicians at any of the one hundred depots where it is on sale, free of

charge, for administration to persons who are too poor to pay for the remedy.

In connection with the study of diphtheria, experimental investigations are constantly being carried on to determine the virulence of the diphtheria bacilli found in healthy throats, in simple catarrhal angina and follicular tonsilitis, and regarding the various matters which relate to the bacteriological study of this disease.

The attitude assumed by the Health Department of New York city towards pulmonary tuberculosis, and the measures adopted for its prevention, constitute, in my opinion, a most important feature of its work. No more striking example of the influence of inherited and transmitted beliefs and prejudices can be found than is afforded by the exhibition of hesitation and reluctance on the part of the proper authorities to assume the sanitary supervision of the tubercular diseases. It is now universally admitted that tuberculosis is infectious and communicable, and the most fatal disease to which the human race is subject; yet as a rule no effective measures, or no measures at all, have been adopted by sanitary authorities with relation to it. Nevertheless, we believe it may be more easily controlled than any other of the principal infectious diseases with which we have to deal, and that it is of as great importance—judged by the deaths it causes—as all the others together. The full courage of scientific conviction seems to have been generally lacking among public officers in dealing with this disease.

The Health Board of New York city first began an educational campaign in relation to the causation and prevention of pulmonary tuberculosis in 1889. In that year a communication on this subject, presented by the writer and the associated Consulting Pathologists of the Department, was widely published, and leaflets, based on it, giving the essential facts as to the nature of this disease, were freely distributed. No further action was taken at that time, as investigation showed that the medical profession and the public were not then prepared for more extended measures.

In December, 1893, the attention of the Department was again called to the subject by the writer, and it was determined to at once institute more comprehensive measures for the prevention of this disease. The measures then adopted required the notification of all cases of pulmonary tuberculosis occurring in public institutions, and requested reports of cases occurring in the practice of private physicians. They also included arrangements for the bacteriological examination of sputum, to assist in the early diagnosis of this disease; the inspection of all reported cases in tenement houses, lodging houses,

hotels and boarding houses, and the instruction of the patients and their families as to the nature of the disease and the means to be taken for its prevention; the inspection of the premises in all instances where deaths were reported as due to tuberculosis, and the issuing of orders, when it was deemed necessary, upon the owners of apartments which had been occupied by consumptives and vacated by death or removal, requiring that such apartments be thoroughly renovated, by cleaning and by painting, papering or kalsomining, before they were again occupied by other persons; and finally the education of the public, by wider and more comprehensive methods, as to the nature of this disease.

Placards were attached to the doors to prevent the re-occupation of apartments, which had been vacated by death or removal before the orders requiring renovation had been complied with.

Under the resolutions by virtue of which these measures were enforced, 4,166 cases of tuberculosis were reported in 1894; 5,818 in 1895, and 8,334 in 1896. So far as was possible all of these cases, except those in private houses, were visited or the premises where they had lived were inspected, and, in addition, the premises occupied by persons dying from tuberculosis (numbering each year nearly 6,000) were inspected and such action taken as was considered possible and desirable. Altogether the premises and cases thus coming under observation during these three years numbered more than 35,000.

These facts convey some idea of the enormous sanitary importance of the subject. It is conservatively estimated that there are at least 20,000 cases of well developed and recognized pulmonary tuberculosis now in New York City, and an additional large number of obscure and incipient forms of the disease. A very large proportion of the former cases constitute more or less dangerous centres of infection, the degree of danger depending in each instance upon the intelligence and care which is exercised in the destruction of the expectoration. All the suffering and death consequent upon the prevalence of this disease, in view of modern scientific knowledge, is largely preventable by the careful observation of simple, well understood and easily applied measures of cleanliness, disinfection and isolation.

In the beginning of 1897, the Health Board further adopted some recommendations made jointly by Dr. T. Mitchell Prudden, Consulting Bacteriologist to the Health Department, and the writer, which advised that pulmonary tuberculosis be declared to be an "infectious and communicable disease, dangerous to the public health," and which required "the notification of all cases occurring in the city," in the same way as is required in regard to typhoid fever, diphtheria and

other similar diseases. Tuberculosis, however, in accordance with the special section of the Sanitary Code, enacted to provide for these measures, is distinctly separated from the eruptive diseases—is not classed with them as a contagious disease, but is referred to as "an infectious and communicable disease." It has always appeared to the Health Board exceedingly desirable that a broad distinction should exist in the public mind between this disease and those diseases which are more properly classed as contagious.

In the treatment of apartments, which have been occupied by tubercular patients and vacated by death or removal, renovation has been and is ordered, rather than disinfection attempted, because the Health Board has always felt that disinfection for tuberculosis in the poorest tenement houses was too difficult to be satisfactorily performed, and has considered renovation as certainly efficient. In the thousands of orders requiring the renovation of premises, which have been issued under the resolution referred to upon the owners of real property during the last four years, little or no difficulty has been experienced in enforcing compliance, and rarely has there been serious objection.

Public institutions, hospitals, asylums, homes, &c., are now not only required to report the name, last address, sex, age and occupation of every case of tuberculosis coming under observation within one week of such time, but they are further required to notify the Department of the discharge or transfer of such patients. The purpose of this procedure is to keep under more or less constant supervision those cases of pulmonary tuberculosis which occur among the poorest classes of the population ; in other words, those which are most likely to be dangerous sources of infection to others. Unfortunately, at the present time there are no hospitals, directly under the control of the Health Department, for the care or isolation of cases of pulmonary tuberculosis ; but it is hoped that such hospitals may be soon provided.

The best medical opinion forbids that persons suffering from pulmonary tuberculosis be treated in association with other classes of cases in the general medical wards of general hospitals. This opinion is based on the daily observations of dangers incident thereto, and it has very properly resulted in the exclusion, to a large extent, of persons suffering from this disease from many of the general hospitals to which they were formerly admitted.

A large experience has also shown that in institutions devoted solely to the care of consumptives the general welfare of the patients is more easily fostered, the risks of fresh infection more certainly diminished and the chances for recovery more surely enhanced than in general hospitals in which all classes of cases are received.

From the beginning of this work, the officials of the Health Department of New York City have encountered, in the lack of proper facilities for the care of consumptives, a great obstacle to practical success, and I am convinced that the grave responsibilities which rest upon sanitary authorities generally in this matter cannot be properly discharged without the establishment, under their direct control, of additional special hospitals for the care and treatment of this disease. No week passes in which the officers detailed to this work in New York do not encounter many instances in which the members of many households, numerous inmates of crowded tenement houses, employees in dusty and unventilated workshops, and many others, are dangerously exposed to infection from victims of this disease, who cannot gain admittance to the over-crowded public institutions, or who reject all proffered assistance and instruction, and, from ignorance, indifference, or inability through weakness due to the disease, scatter infectious material broadcast, thus diminishing their own chances for recovery and imperilling the health and safety of others. In such cases sanitary suggestions are futile, and removal to a hospital constitutes the only effective action. I am convinced that no factor is so potent to-day in perpetuating the ominous death list from pulmonary tuberculosis as the lack of proper facilities for the adequate care of the poor stricken with this malady.

The measures designed for the prevention of tuberculosis, properly include not only those which relate to the transmission of the disease from human beings to each other, but also those which relate to the transmission of the disease from affected animals, especially the bovine species, to human beings, through the meat and milk used as food. The Health Department of New York City, while feeling strongly that the most important source of infection is through the sputum of consumptives, has yet elaborated with great care methods for protecting the public, so far as lies within its power, from infection by the meat and milk of tubercular animals. In order that a more effective control of the milk supply should be possible, an ordinance was passed in 1895 forbidding the sale of milk within the city without a permit from the Health Department, and requiring that all wagons used for transportation or delivery of milk should likewise have wagon permits. Before these permits are issued, the holder of the permit must furnish information as to the source from which the milk is obtained, the number of animals, the character of the food supply, and the sanitary conditions surrounding the dairy. Special regulations have been established with regard to the sale of milk, and permits may be revoked at any time by the Health Board, where

evidence exists that the regulations have not been strictly complied with. All milch cows in New York City (about 3,000 in number), are now being subjected to the tuberculin test, under the supervision of the Health Department, and animals found to be diseased are killed. It is proposed, as soon as this work is completed in New York City, to require similar tests to be applied to all cows whose milk is sent to New York City. There also exists a careful inspection of animals slaughtered for food, and of all meat sent into the city, and the carcasses of those found to be tubercular are destroyed.

Most beneficial effects have already resulted from the various measures instituted for the prevention of this terrible disease. Not only has there been a very material decline in the number of deaths occurring from it, but there has been a most gratifying increase of knowledge and intelligence as to its nature among the poorest class of the population. The inspectors detailed for this work report, that on their first inspection, in nearly one-half of the cases occurring in many parts of the tenement house districts of the city, it is found that more or less efficient precautions are being taken for its prevention. Such precautions are the use of rags to receive the sputum, which are later burned, instead of handkerchiefs ; the use of cups containing water or a disinfecting solution ; the separation of the clothing of the patient from that belonging to others, and similar measures.

This increase of intelligence, and the precautions resulting from it, afford the greatest promise for the future, of a persistent and still more rapid decline in the frightful morbility and mortality caused by the tubecular diseases.

Investigations made by the Department, showing that the dust in the street cars and various public places is often infectious, led to the enactment of an amendment to the Sanitary Code prohibiting spitting on the floors of street cars, ferry boats and other public conveyances, and requiring that all companies should post in their cars, boats, &c., printed notices forbidding this. This regulation is very difficult of enforcement ; but, while the results have been by no means entirely satisfactory, there has yet been a definite improvement in the existing conditions.

The method employed for recording and plotting cases of diphtheria is also used for cases of tuberculosis. I have had prepared transcripts from the maps on which are platted the cases of diphtheria and tuberculosis, to show the distribution of these cases in certain wards of the city. These wards have been selected in each instance because of the large number of cases of the respective diseases occurring in them.

Maps 1 and 2 show respectively the 4th and 6th wards, with the distribution of reported cases and deaths from tuberculosis in these wards during three years. The cases and deaths in 1894 are platted with a circle; cases and deaths in 1895 with a triangle, and the cases and deaths in 1896 with a dagger. The dwelling houses in the maps have been coloured so as to put them in contrast with buildings not occupied as dwelling houses. Thus the dwellings which had one or more cases of tuberculosis during this period are coloured pink, and those free from tuberculosis during these years are coloured blue. The plots which are uncoloured are not dwelling houses, but occupied as business buildings, warehouses, etc.

These maps argue more forcibly for the infectious and communicable character of this disease than could any words. It should be said, however, that in some instances. where a large number of cases have occurred in one house during these years, the house had been occupied as a Chinese lodging house. This is especially true of several of the houses on Pell and Mott streets.

Maps 3 and 4 show the distribution of cases of diphtheria for the same period in the 10th and 13th wards. These maps, as has been said, are simply transcripts, reduced in size, from the maps on which are plotted, day by day, the reported cases and deaths from these diseases throughout the city.

TABLE I.

Analysis of Distribution of Reported Cases and Deaths from Tuberculosis in Wards IV. and VI.

Years 1894, 1895, 1896, to March, 1897.

Ward IV.

According to the census of 1896, there were 663 inhabited houses in Ward IV., with a population of 18,323, or an average number of 27.6 persons per house.

No. of houses in which cases occurred	248
" cases in 1894	173
" " 1895	161
" " 1896–97	207
Total number of cases in 3 years	541
Average number of cases per infected house	2.81
Percentage of houses infected	37.3
Average number of cases per house in ward	0.81
Cases per 1000 population in 1894	9.4
" " " 1895	8.7
" " " 1896-97	11.2
Total cases per 1000 population in 3 years	29.3

TABLE II.

Ward IV.

Houses showing 3 or more cases each of tuberculosis.

No. of houses in which 3 or more cases occurred	70
" cases in 1894	88
" " 1895	95
" " 1896-97	119
Total cases in these houses in 3 years	302
Average number of cases per house	4.3

Comparing these figures with those obtained for the whole ward:

Total number of infected houses in Ward IV	248
Number of houses in which 3 or more cases occurred	70
Percentage on total infected houses	28.2
Total number of cases in ward	541
Cases occurring in 28.2% of the houses infected	302
Percentage of total cases	55.8
Total number of inhabited houses	663
Number of houses in which 55.8% of cases occurred	70
Percentage in total houses	10.5

It is thus seen that of the infected houses 28.2 per cent. contained 55.8 per cent. of the cases, and these occurred in only 10½ per cent. of all the houses in Ward IV.

TABLE III.

Ward VI.

According to census of 1896, there were 630 inhabited houses in Ward VI., with a population of 22,897.

No. of houses in which cases occurred	239
" cases in 1894	157
" " 1895	127
" " 1896-97	191
Total number of cases in 3 years	465
Average number of cases per house	1.94
Total number of dwellings in ward	630
Number of houses infected with tuberculosis	239
Percentage of infected houses	37.9
Average number of cases per house in ward	0.72
Cases per 1000 population in 1894	6.8
" " " 1895	5.5
" " " 1896-97	8.2
Total cases per 1000 population in 3 years	20.5

TABLE IV.

Ward VI.

Houses showing 3 or more cases each of tuberculosis.

No. of houses in which 3 or more cases occurred	45
" cases in 1894	72
" " 1895	56
" " 1896-97	78
Total cases in these houses in 3 years	206
Average number of cases per house	4.5
Comparing these with the figures obtained for the whole ward :	
Total number of infected houses	239
Number of houses in which 3 or more cases occurred	45
Percentage of total infected houses	18.9
Total number of cases in ward	465
Cases occurring in 18.9 p.c. of the houses infected	206
Percentage of cases in same	44.3
Total number of inhabited houses	630
Number of houses in which 44.3 p.c. of cases occurred	45
Percentage in total houses	7.1

Thus, 44.3 p.c. of the cases occurred in 18.9 p.c. of the infected houses, and these constituted only 7.1 p.c. of all the houses in Ward VI.

I desire to now refer briefly, to the system of medical school inspection, instituted by the Health Department during the last year, which has given thus far most satisfactory results, and which promises greater good in the future.

Early in 1897, under the authority of a special resolution of the Board of Estimate, 150 Medical School Inspectors were appointed by the Health Board, after Civil Service examination. The duties of these inspectors consist in the examination daily, at the opening of the primary and grammar departments of each of the public schools and of the parochial and industrial schools, of all the children who are set apart by the respective class room teachers as not appearing to be entirely well. These children are examined in each school by the Inspector detailed to the school, and are either excluded from the school room, or returned to the class depending on the result of the examination. Every pupil found to be suffering from any form of general contagious disease, or any contagious disease of the eye or parasitic disease of the skin, is sent home, with a written statement to the parents of the cause for the action, and in case of the eruptive diseases and diphtheria, reports are immediately forwarded to the Chief

Inspector of Contagious Diseases, and by him referred to the various District Medical Inspectors for inspection and supervision.

During three months, (65 school days) in which this system has been in operation, there have been examined 63,812 children, who had been set aside by the teachers as not appearing entirely well, of which number 4,183 were excluded for the following reasons:

Measles	88
Diphtheria	167
Scarlet fever	32
Croup	11
Whooping cough	26
Mumps	117
Contagious eye diseases	702
Parasitic diseases of head	2,627
Parasitic diseases of body	108
Chickenpox	130
Skin diseases	175
	4,183

The children excluded because they were thought to be suffering from Measles, Scarlet fever, Diphtheria and Chickenpox, were afterwards seen by the Medical Inspectors and in the majority of cases the original diagnosis was confirmed.

The educational work of the Health Department is, I believe, of great importance. It has been the custom of the Department for some years past to issue from time to time circulars of information on various topics, and especially with relation to the infectious diseases, their diagnosis, treatment or management. Some of these circulars are popular in character, very large editions being published, 50,000 or more at a time, and are designed for general distribution, particularly among the tenement house population.

Examples of this class are the following: "Information for Consumptives and their Families," "Infant Feeding," "Methods of Transmission of Contagious Diseases," and numerous others on similar topics. Circulars of information are also issued which are designed for distribution among the medical profession. These relate to the work of the Health Department in connection with infectious diseases, or to the bacteriological products of the laboratories. Many such circulars have been issued on various topics connected with diphtheria, such as "Bacteriological Examinations for the Diagnosis of Diphtheria," "Relation of Membraneous Croup to Diphtheria," "Diphtheria Antitoxin," "Persistence of Diphtheria Bacilli in the Throat during Convalescence from Diphtheria," "Occurrence of Diphtheria

Bacilli in Healthy Throats and in Catarrhal Angina," etc. Other circulars of information have been issued on "The Importance of Bacteriological Examinations in the Early Diagnosis of Pulmonary Tuberculosis," "The Nature and Causation of Pulmonary Tuberculosis," "The Measures adopted by the Board of Health for the Prevention and Restriction of Pulmonary Tuberculosis;" and on the use of "Mallein," "Tuberculin," "Tetanus Antitoxin," "Glycerinated Bovine Vaccine Virus," etc.

As these various circulars are published by the Health Department, copies of them are sent to the medical journals published in New York city and to the daily press. Thus they gain at once a wide circulation. In addition, some one or more of these circulars is included in each report of the results of the bacteriological examinations in diphtheria and tuberculosis, as they are sent from the laboratories. As more than one hundred reports daily are sent out, a large circulation is again attained among physicians in this manner. In some instances, circulars considered to be of unusual importance have been delivered by messenger to the house of every physician in New York city.

Aside from the circulars described, numerous scientific bulletins have been issued from time to time from the bacteriological laboratories, detailing the results of original investigations in connection with infectious diseases, and these bulletins are widely distributed among the profession of New York city.

I do not believe that the importance of this educational work can be over-estimated. Its value is incalculable in widely disseminating popular and scientific information with regard to the results of the latest studies in infectious diseases, and there have been constantly exhibited in New York the most gratifying indications of the influence of the information thus distributed, on both the general public and the medical profession.

More than this, the circulars keep constantly before the medical profession and the laity the work, the duties and the functions of the Health Department, as related to the people and the profession.

It has been frequently urged, especially in the earlier work of the New York City Health Department, that the methods proposed were theoretically commendable enough, but that they were impracticable. This criticism has been often made, particularly in Europe. The best reply to it is, that the results have shown that they are not impracticable. What has been described is not something that it is proposed to do, but it is a statement of what has been and is being

done, and this work, as briefly outlined in some of its phases, is to be considered as only introductory.

It is the purpose of the Health Board to establish a supervision of all infectious diseases along the lines which have been thus far developed in relation to tuberculosis and diphtheria, as rapidly as the scientific knowledge at command will make such a course possible.

The final test of the efficiency of any scheme of sanitary control and of the healthfulness of any community or locality is found in the morbility and mortality statistics, considered in relation to the causes of sickness and death. It is not simply the number of deaths or cases of sickness in proportion to the population, but also the nature of the diseases which cause morbility and mortality.

In comparing the statistics for different localities, however, the special factors relating to each locality must be taken into consideration; for a death rate which would indicate unusually favourable conditions in a large city, might show far from favourable conditions in a rural population. The density of population has generally a very definite relation to the mortality.

Dr. Farr attempted to deduce a formula by which the mortality of any locality could be translated into that of another having a different degree of aggregation of the population. He showed that when the population has reached a certain density, there is a constant and uniform increase in the death rate with any further increase in its density. For example, in 50 districts in Great Britain, with a population of 2,500,000 and with 650 persons to a square mile, the death rate was 20.5 per thousand. In those districts which contained 2,100 persons to a square mile, and a population of 2,000,000, the death rate had increased to 24.4; with a population of 2,800 to a square mile the death rate had further increased to 25.5, and with a population of 6,144 persons to a square mile, the death rate was 30.2.

The local variation in mortality with the density of population has not been constant in New York City, for in some of the wards, where the density of the population is greatest, the mortality has been below the average, and in other wards, with a relatively scarce population, the mortality has been extremely high. Other factors have exerted an even greater influence on local variations of mortality than density. The highest death rates have been found in the lower and oldest parts of the city, where the buildings are old and the sanitary conditions in many respects unfavourable.

The nationality of the population has a definite influence, as has been shown in an analysis of the death rates in different parts of New York City made by Dr. Roger S. Tracy, Registrar of Vital Statistics. Those districts with the densest population, where the rates are comparative-

ly low, are largely inhabited by Russian and Polish Jews, who are a hardy race and proverbially long lived. On the other hand, the wards having the highest death rates, or nearly the highest, are occupied largely by Italians, among whom, in the United States at least, the death rate is exceedingly high.

The sanitary problems presented in a city like New York are unusually difficult, on account of the diversity and cosmopolitan character of the population. The presence of large numbers of foreign born inhabitants of many different nationalities, grouped often in restricted localities and retaining their native customs and modes of life, and the great density of the population, constitute factors which largely complicate the situation.

The physical conformation of Manhattan Island is, in some respects, exceedingly unfavourable. The island is long and very narrow, and as a result certain parts of the city, and in fact the island as a whole, is over-crowded. Fully three-fourths of the population live in tenement houses, which are five, six or more stories in height, and contain from two to four or more families on each floor. Each house is placed on a lot not more than 25 x 100 feet, and frequently 20 families, numbering more than 100 persons, live on an area of this size.

The average density of population in New York city below the Harlem River, *i.e.*, on Manhattan Island, is greater than that of any of the other great cities of the world. The only localities approaching in density of population certain wards in New York are a small area in Paris, where the population is 430 to the acre; one district in Prague, where the population is 485 to the acre; the Whitechapel district in London, which has a population of about 300 to the acre in Spitalfields, Mile End and Newtown, and 365 in Bethnel Green. In New York city, Sanitary District A. of Ward XI. has a population of more than 800 to the acre; Ward X., over 640 to the acre; Ward XIII., 540; Ward XVII., 430; Ward VII., 360; and Ward XIV., 295.

These facts must be kept in mind in considering the mortality statistics of New York, as compared with those of the large cities of Great Britain and the Continent. With these before us, the diminution in the death rates, and the present death rate, are most significant.

A comparison of the mean total death rate for decennial periods in New York City since 1834 shows that there was an increase during the first three periods ending in 1863, and that since that date there has been a continuous and very heavy decline in the rate, especially marked in the most recent years. The mortality in New York arose to such a high point that the inhabitants became alarmed, and in 1866 the Health Department as now constituted was organized. In

the decennial period ending in 1843 the mean death rate was 28.03; for the period ending 1853 it had risen to 33.81; during the next period ending in 1863 it was 33.94. Since that time it has declined to 31.11 for the decennial period ending in 1873; to 26.87 for the period ending in 1883; to 25.78 for the period ending in 1893, while in the year 1894 it was 22.76; in 1895, 23.10; in 1896, 21.54, and for the first half of 1897, 19.60. The population meanwhile has increasedfrom 312,090 in 1840 to an estimated population of 1,990,000 on July 1st, 1897.

The mortality rate is normally higher for the first half of the year than the second half, and it is therefore probable that the rate for 1897 will be a fraction over 19, or a diminution of 25 per cent. on the death rate for the decennial period ending in 1893.

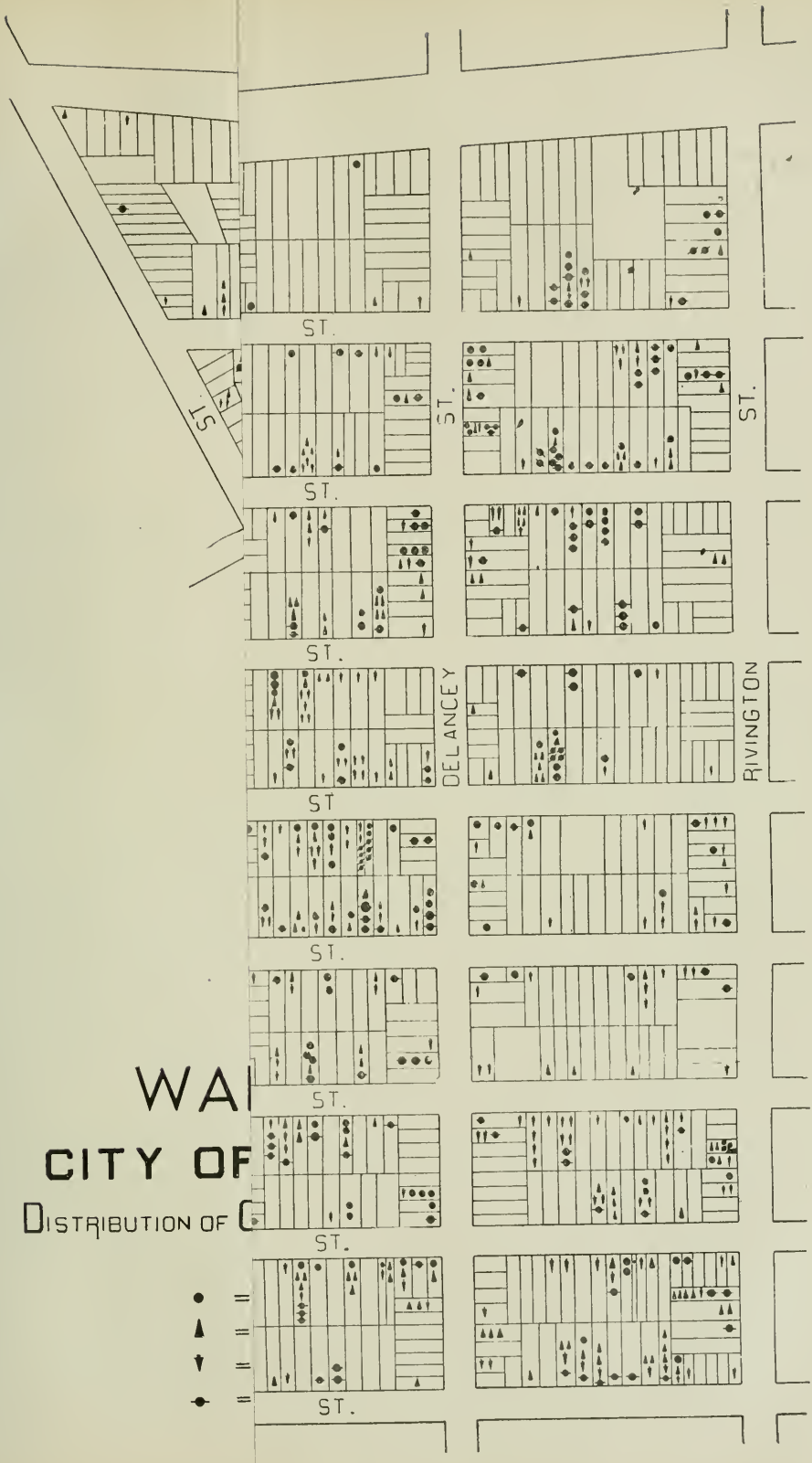
The percentage of mortality occurring in children under five is always high, and has been long regarded as an excellent index of existing sanitary conditions. The injurious effects of unsanitary conditions and surroundings always fall heaviest upon the youngest element of the population.

TABLE V.

NEW YORK CITY.

Annual death rate for all causes, and for certain diseases, 1886—1896, inclusive, and January—July, 1897:

Year.	All causes.	Diphtheria and Croup.	Phthisis.	All Tubercular diseases.	Measles.	Smallpox.	Scarlet Fever.	Typhoid Fever.	Diarrhœal diseases of children under five years.	Diphtheria and Croup, all Tubercular diseases, Measles, Smallpox, Scarlet Fever, Typhoid Fever, and Diarrhœal diseases of children under five years.
1886	25.99	1.87	3.79	4.42	0.46	0.022	0.26	0.23	2.08	9.34
1887	26.32	2.06	3.56	4.06	0.52	0.067	0.40	0.22	2.20	9.53
1888	26.39	1.68	3.46	3.99	0.39	0.050	0.89	0.24	2.00	9.24
1889	25.32	1.46	3.31	3.86	0.30	0.0006	0.79	0.25	2.00	8.66
1890	24.87	1.11	3.41	3.97	0.45	0.001	0.25	0.22	1.86	7.86
1891	26.31	1.19	3.11	3.56	0.40	0.001	0.74	0.23	1.92	8.04
1892	25.95	1.23	2.95	3.55	0.51	0.050	0.57	0.23	1.85	7.99
1893	25.30	1.45	2.91	3.51	0.22	0.060	0.31	0.22	1.65	7.42
1894	22.76	1.59	2.57	3.16	0.32	0.085	0.30	0.18	1 50	7.14
1895	23.11	1.05	2.77	3.34	0.42	0.005	0.25	0.17	1.51	6.75
1896	21.52	0.91	2.58	3.06	0.37	0.0005	0.21	0.15	1.32	6.02
Jan.-July, 1897	19.60	....	2.44	2.97	0.20	0.021	0.30	....	....	....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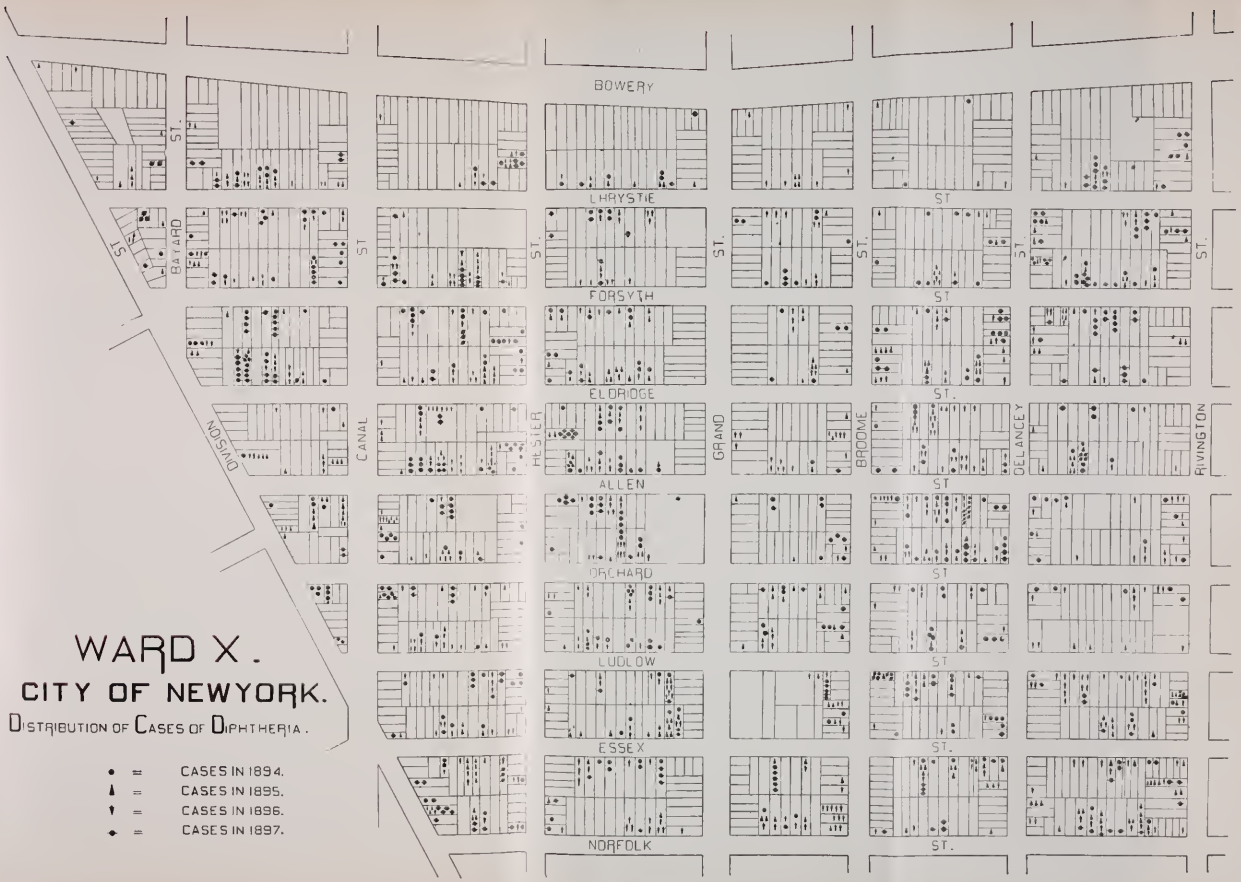

WARD X.

CITY OF NEWYORK.

DISTRIBUTION OF CASES OF DIPHTHERIA.

- • = CASES IN 1894.
- ▲ = CASES IN 1895.
- ▼ = CASES IN 1896.
- ◆ = CASES IN 1897.

TABLE VI.

NEW YORK CITY.

Death rates for all causes and for certain diseases, by decennial periods, 1844 to 1893; by years, 1894, 1895 and 1896, and January—July, 1897.

	All causes.	Over 5 years of age.	*Under 5 years of age.	‖Miasmatic, Diarrhœal and Tubercular Diseases.
§1844 to 1853	33.81	....	....	....
1854 to 1863	33.94	....	....	....
†1866 to 1873	31.11	17.2	123.3	13.2
1874 to 1883	26.87	16.4	104.7	11.8
1884 to 1893	25.78	16.8	95.1	9.3
1894	22.76	14.7	85.3	7.5
1895	23.11	15.1	85.3	7.2
1896	21.52	14.5	76.4	6.4
Jan. to July, 1897	19.60	13.9	64.8	‡5.4

Table VI. shows the death rate from all causes and the rate over and under five years of age for the decennial periods since 1866, and for 1894-95-96, and the first half of 1897.

As will be seen, the average death rate in children under five for 1894, '95 and '96, was 40 or more per 1,000 less than the average rate during the eight year period ending in 1873, and in 1896 was 47, or 38 per cent. less than for this period, In 1897, there will undoubtedly be a still greater diminution, although the death rate for children under five for the first six months of the year cannot be taken as the

* The population under five years of age is computed for each decennial period or year as 11.37 per cent. of the total population, based on the census of April, 1895. In 1880, the per centage of population under five years to total population was 11.63 based on the United States census of that year.

† 8 years only; 1866-1873. Health Department organised in 1866.

‡ This rate is comparatively too low, as the deaths from diarrhœal diseases are at a maximum during the third quarter of the year.

§ The general death rate prior to 1851 is below the actual rate, as the registration of deaths, where burials occurred within the city limits, was not required by law.

‖ Miasmatic diseases include: Smallpox, Measles, Scarlet Fever, Typhoid Fever, Typhus Fever, simple and ill-defined and irritative fevers, Diphtheria, Croup and Whooping Cough.

The rates given in the above tables are the crude death rate.

average for the year, as the deaths from diarrhœal diseases are always much lower during the first half of the year.

This table also shows the combined death rate from miasmatic, diarrhœal and tubercular diseases for these same periods and years, and, as will be noted, there has been a dimunition of more than 50 per cent. in the deaths from these diseases during these years.

The search for the causes of diminished mortality from all causes shows that the largest reduction has been in the zymotic death rate, including diarrhœal diseases of children under five, and there has been also a steady and important decline in the tubercular death rate since 1886. (Table V.)

Investigation further shows that a special reduction in the mortality from diphtheria and croup, amounting to nearly 40 per cent., has occurred since the introduction of diphtheria antitoxin with the beginning of 1895. This reduction has taken place in spite of an increase in the number of reported cases of this disease. Up to the beginning of 1895 there had been a steady increase for some years in the mortality from diphtheria and croup, and for the year 1894 the death rate was higher than that from any other single disease, excepting tuberculosis and pneumonia—pneumonia really including a number of different affections. The combined death rate from measles, scarlet fever, diphtheria, croup, smallpox and typhoid fever has been reduced almost exactly one-half within ten years, the rate for 1896 for these diseases being 1.64 per 1,000 population, as contrasted with 3.26 for 1887; for 1897 it will apparently be still lower.

The government of the United States is democratic, but the sanitary measures adopted are sometimes autocratic, and the functions performed by sanitary authorities paternal in character. We are prepared, when necessary, to introduce and enforce, and the people are ready to accept, measures which might seem radical and arbitrary, if they were not plainly designed for the public good, and evidently beneficent in their effects. Even among the most ignorant of our foreign-born population, few or no indications of opposition or resentment are exhibited to the exercise of arbitrary power in sanitary matters. The public press will approve, the people are prepared to support, and the Courts sustain, any intelligent procedures which are evidently directed to the preservation of the public health. The belief is never aroused in any class of the population, however ignorant, that the institution or enforcement of any sanitary measure is primarily designed for the restriction of individual freedom. There is nowhere to be found any jealousy or distrust of law or government, as such. It is, therefore, possible to adopt measures

more arbitrary in many respects than could be adopted in most other countries, simply because our government is democratic.

This gives the key note to the attitude of the sanitary authorities of New York. The most autocratic powers, capable of the broadest construction, are given to them under the law. Everything which is detrimental to health or dangerous to life, under the freest interpretation, is regarded as coming within the province of the Health Department. So broad is the construction of the law, that everything which improperly or unnecessarily interferes with the comfort or enjoyment of life, as well as those things which are strictly speaking detrimental to health or dangerous to life, may become the subject of action on the part of the Board of Health. It attempts not only to increase the healthfulness of the city, but also to render it a more enjoyable and comfortable place of residence. In its relation to the medical profession, it aims to give every assistance, which the latest scientific investigations can place within its power, in the treatment and management of communicable and infectious diseases, while not interfering in any way with the privileges or prerogatives of the medical attendant, unless such interference becomes necessary for the protection of other persons from possible infection. It prescribes specific regulations as to the management of infectious diseases, the violation of which may be followed by the forcible removal of the patient to its hospitals. The public press, quite without reference to its political affiliations, offers a unanimous and most cordial support to the policy of the Board.

The conduct of sanitary matters in New York is restrained by no traditions or precedents. It is determined, from month to month, by what is believed to be for the best good of the inhabitants, in view of the most recent knowledge and the latest developments in scientific medicine.

The limits of this address do not permit, nor is it desirable, that I should touch upon many of the other phases of the work of the Health Department indirectly related to the prevention of disease, and the preservation of the public health.

It has been my purpose, as was stated in the introduction, simply to detail some of the features which have more particularly distinguished the work of the New York City Health Department and to describe some of the phases of the sanitary supervision of certain infectious diseases, which have been introduced by it.

I believe it may be truly said that there is no great city in the world to-day which, in the broad sense, is cleaner and healthier than New York. By clean is meant the purity of the atmosphere, the

cleanliness of the streets, the abundance and purity of the water supply, and the efficiency of the sewerage system. I wish that so much could be said as to the character of the habitations of the poor, the public baths and public convenience stations, the breadth of its parks and public commons, and the type of its charitable and penal institutions. In many of these respects New York is deficient; but great and rapid advances have been made and are being made in these matters.

When it is said that no city is healthier than New York, this statement is made with a consideration of all the sanitary factors in the situation, such as the size and density of the population, the varied nationality of the inhabitants, the character of climate, &c.

Nowhere can there be found a fuller recognition than in the United States, of England's high standard of excellence in public medicine, or a more sincere appreciation of her vast contributions to the progress of sanitary science. But she must look well to her laurels, if her cities are to be kept cleaner than the great cities of the United States, and her urban population made healthier and happier than the same class on this side the Atlantic.

In the United States we are prepared to adopt, without hesitation, the best that England produces, or that the world affords, in public medicine, as well as in science, art, and commerce; and notwithstanding the persistent and determined efforts of our sensational press, the sentiments of the medical profession, and of the people at large, towards Great Britain are those of sincere respect for her institutions, profound admiration for her great achievements, and warm affection for her people.

If I have appeared in this address to have dwelt too long upon and described too fully some of the sanitary methods followed in New York, I would urge in extenuation that it has been from a desire that you should know our institutions and methods, as well as we know yours, and that through the medium of this great medical association, the largest and most influential in the world, the two great English-speaking nations might, in this respect, be brought into somewhat closer and more intelligent relations with each other, and thus greater good redound to preventive medicine, so that the people of both nations may live healthier and therefore, longer and happier lives.

PRESIDENT'S ADDRESS.[1]

BY

V. H. Moore, M.D.

Gentlemen,—Permit me to thank you for the great honour you have conferred upon me in electing me President of this Association. I am deeply sensible of my inability to fill the position in an efficient and becoming manner, therefore I shall have to ask your kind indulgence and trust you may judge generously. I am delighted to see distinguished members of the medical profession of Great Britain present to-day. I can assure you, gentlemen, we do not look upon you as strangers, but as brothers, not alone in our profession, but as our own kith and kin, members of one great family, living under the same sovereign, the same flag, the same laws, speaking the same language and actuated by the same motives.

Your presence and the holding of the meeting of the British Medical Association in this country marks an epoch in our history. It is a red-letter day for Canada.

This meeting will serve to unite the profession more closely and will tend to strengthen that firm bond of union which cements the colonies so securely to the mother country. I am pleased to see so many of our distinguished cousins from the country to the south of us here on this occasion. The medical profession in that great Republic has been keeping pace with every advance made in medical science. They are industrious, persevering, and energetic, quick to see, ready to adopt and eager to carry out any and all improvements and discoveries to a successful or final issue, hence it is not surprising that they have made such progress. Our intercourse with them has been both pleasant and profitable, and each reunion only serves to make the friendship more enduring. I am aware of the fact that at meetings of this kind it has been customary for the President to embody in his address a resumé of the discoveries and advances made in medicine during his tenure of office; and, while this would have been more congenial to me, I have chosen, owing to the existing circumstances, to adopt another course, and to limit my observations largely to the condition in which we find medical and other branches of education in this country to-day.

Twenty-nine years ago on the ninth day of last October, or one

[1] Read before the Canadian Medical Association, Montreal, August 30. 1897.

hundred days subsequent to the passing of the British North America Act, which bound together four provinces in one dominion, and while the patriotic pulse beat high, a few of the leading medical men of the new Dominion met in the city of Quebec and rounded off the grand work of that year by forming the Dominion Medical Association.

The first president was one of the ablest advocates and most zealous workers among the fathers of Confederation. He, I am happy to say, still lives and still labours for the good of his profession and country. He has deserved well of his country and has been honoured by her, and by Her Gracious Majesty; I refer to Sir Charles Tupper, Bart., who is known wherever Canada is known. The objects sought to be attained by the formation of this Association were:

1st. To promote the science of medicine.

2nd. To unify the members of the medical profession in this Dominion.

3rd. To secure a uniform standard of medical education, both in the requirements preliminary to the study of medicine, and for the license to practice, after graduation, in the Dominion.

That the first object of this Association has been attained no one will deny. This society has contributed largely to the advancement of all branches of medical science in Canada. Our ablest medical men and some of the ablest of Great Britain, as well as of the neighbouring Republic, have attended its meetings and contributed papers of the highest order.

The second object has also been attained. It has brought the members of the profession from all parts of this country together, and they have thereby learned the status and requirements of medical education in each province. An opportunity was thus offered for a full and free discussion, and it is gratifying to know that a common desire for uniformity in medical education inspires the profession throughout the whole Dominion.

The third object, I regret to say, has not yet been reached, but I feel confident that through the efforts and influence of the members of this association it soon will be an accomplished fact.

By the provisions of the British North America Act all matters of an educational nature were given over to the Legislatures of the Provinces, they to make such laws, rules and regulations as to them seemed proper. Whether this was wise or not I am not prepared to say, but it appears to me that the question of education is of a national rather than a provincial character, more especially medical science, as it knows no geographical confines.

Soon after the formation of the legislatures, the medical profession in each province believing it to be in their interest, as well as in the interest of the public, sought and obtained from their respective legislatures an act, entitled "The Medical Act," which provided for the formation and election of a Medical Council.

By virtue of the provisions of this Act, the licensing power and the complete control of medical education were given to and vested in this body. This Council was to be a representative body and to be re-elected once in a given number of years. Unfortunately, no concerted action took place between the members of the profession in the different provinces before appealing to the legislatures, and the results were just what might naturally be expected, striking differences in the acts asked for and obtained. These diversities still exist and it is these dissimilarities that offer to-day the greatest barrier to interprovincial registration.

To my mind there is nothing of more importance to the medical profession in Canada than uniformity in medical legislation. Now that we are nearly all of one mind, only divided upon issues which are of no vital importance, let us make an earnest appeal to our lawmakers and have the clauses not in harmony repealed. I trust that at this meeting a representative committee may be appointed to draft a medical act suitable for the whole Dominion. When this is accomplished, a copy can be placed in the hands of each Provincial Medical Council, with the request that they appeal to their respective Legislatures to amend their existing medical acts so as to harmonize them with the proposed one and have them become law. Interprovincial registration will then be an easy matter and would be readily accomplished. Then we could turn our eyes eastward to the Mother Country and seek reciprocity with her; and, as she has always listened attentively to any reasonable request made by us, we might confidently look for the day soon to arrive when our prayer would be allowed, and any man obtaining a license in any of our provinces would be free to practice medicine in any land where floats the Union Jack.

Several members of this Association have gone over to the silent majority during the past year. I will not name any of those worthy men who laboured for the welfare of their fellow creatures. All should be named or none. While in this life they were ever ready to discharge all moral obligations, toiling night and day, living on the stimulant of duty performed, always ready to lighten somebody's burden, knowing but little rest or comfort in this world. Let us

hope that in the serenity of death they have found eternal peace and happiness, a just reward for duty done.

Many of the founders of this Association were not only physicians and surgeons of eminence, but statesmen as well, and their example has been followed by a large number of the ablest members of our profession.

In consequence of the exertions and ability of our medical legislators, in both the Federal and Provincial Parliaments, the public have been educated to the necessity of protecting their lives from the peril of infectious diseases of a preventible character. They have been taught the lesson that there is no boon more worth possessing than life and health. In each province a Provincial Board of Health has been established, and in each municipality, village, town and city a local board of health is annually elected and a medical health officer appointed. The sanitary laws are rigidly enforced in most of the provinces. In the Province of Ontario every physician is compelled, under a heavy penalty, to report, within a very few hours after it has come under his charge, every case of a contagious or infectious nature, to the secretary of the local board of health. The house in which the case is located is immediately placarded, and no inmate is permitted to attend school until the physician in attendance certifies that the disease has disappeared and the house and its contents has been disinfected and are free from contagion. Serum therapy is well understood and its benefits appreciated. Vaccination is made compulsory. The water used for domestic purposes is carefully looked after, and any source which has been shown to be impure is closed up or condemned and the public forbidden to make further use of it. When any section of a city, town or country is shown to be unsanitary, the Provincial Board of Health, upon being notified, immediately proceeds to put it in a condition not dangerous to health. The milk furnished in towns and cities for domestic use is carefully inspected and the results published several times a year, and a heavy fine is imposed when an impure article is offered for sale. The herds of milk vendors are frequently inspected and tested with tuberculin by competent men, and all tuberculous animals are promptly destroyed. Meat offered for sale is carefully watched and any of an unwholesome nature is seized and the person exhibiting it is liable to a heavy penalty. Drainage in all the larger towns and cities is vigilantly looked after, and sanitary inspectors carefully examine all plumbing and report thereon to the board of health. The results following the above precautions have been most gratifying. Diphtheria, typhoid fever and small-pox have been almost stamped out in

many localities, and scarlet fever and measles have been very much modified in their course.

In view of the advance made in preventive medicine in the past two or three decades, may we not confidently hope that within a few years immunity may be secured from most infectious diseases. Preventive medicine now rests upon a sound and promising basis in Canada. Yet, while all this is true, it is to be regretted that a large number of our inhabitants love the mysterious, the occult, the unscientific, and indulge in the dangerous practice of swallowing patent nostrums, and thereby injuring their health and shortening their lives. Credulity still lives in the minds of many and probably always will. Truth is stranger than fiction, and science has invariably travelled an uphill road.

In the Ontario Medical Act there are certain penal clauses to be found which have enabled the Medical Council of that Province to prosecute, fine and imprison charlatans and men practising medicine without a license, and to erase the name of any physician from the medical register (thus depriving him of the right to practise) who has been convicted, either in Her Majesty's dominions or elsewhere, of any offence which if committed in Canada would be a felony or misdemeanor, or been guilty of any infamous or disgraceful conduct in a professional respect. By virtue of this clause in the Act we have been able in Ontario to suppress quackery and drive from the profession unscrupulous men.

Our Provincial Governments have built beautiful homes for those suffering from mental diseases, and provided the best known treatment for these unfortunates. They have aided hospitals and provided domiciles for the incurable, and keep a strict watch over all. They are alive to the fact that to have a progressive and prosperous nation they must have healthy and intelligent people.

The standard of medical education and the requirements exacted in this country will compare favourably with those of any country in the world. We require as high, and in some instances a higher standard of preliminary education than is demanded in Great Britain. The examination for graduation and also for the license to practise is a severe one, and well calculated to test the knowledge of the candidate. A four-year graded course is required in most of the Provinces; in Ontario, a period of five years must be spent in the study of medicine. On and after the first day of October, 1899, four sessions of eight months each, together with a fifth year spent in clinical and practical work, will be demanded. In the Maritime Provinces they favour the eight months' session, while here in McGill College they give a nine months' course.

Our Medical Colleges are well equipped in every respect. The teaching is of the best, and the practical work all that could be desired. There is plenty of material for clinical instruction, and every facility is offered to the student to gain a knowledge of the science of medicine. The opportunities for hospital work are good. We have between sixty and seventy hospitals in Canada, over forty in Ontario alone, and the medical staff in each hospital is up to date, and the work done excellent.

We have over a dozen well equipped Universities, a large number of Collegiate Institutes, high, public and separate schools, well provided with teachers, appliances and accommodation. In Ontario, attendance at school is compulsory. There are few countries, if any, that can boast a better system of education.

The progress that has been made in the science of medicine since the birth of this Association is marvellous. It would be impossible in an address of this kind for any man to adequately portray the changes that have taken place, therefore I say but a few words upon the subject. The advancement has not been exceeded by that of any of the natural sciences. Imagination thirty years ago would have failed to picture the condition of medicine to-day. We are well aware that medicine is not an exact science, and probably never will be, still it has been progressive, and never more so than during the past ten or fifteen years. The discoveries of Pasteur and Koch and their followers have revolutionized therapeutics. A new pathology has been created, based upon scientific knowledge. The technical means of histological and bacteriological research are now nearly perfect. We have arrived at an exact knowledge of physiological and pathological histology. We know it is now possible to diagnose with certainty many diseases which a few years ago offered great obstacles, and only after years of practice and experience could they be recognized. By means of the "X" Rays, the new light, which penetrates opaque bodies, dark recesses the contents of which were unknown are now disclosed and presented for study. Nothing in man's nature can escape the scrutiny of the natural sciences. Dr. Jacobi says:— "The sound mind, its aberrations and freaks, the soul, with its holiness or turpitude, no matter whether considered by the believing philosopher or the searching materialist, are topics of biological study." After the discovery of anæsthesia in 1846, the fields of research were widened and great advances made. The number of voluntary surgical operations was greatly increased, but unfortunately there appeared a dark cloud upon what had seemed a clear sky. Sepsis appeared, death followed, and surgery seemed as though it was

about to run on to its own destruction, when Lister came to the rescue and gave us a new surgery. He pointed out the way to overcome the enemy, the means to be used in its destruction, and what should be done to prevent its resurrection. His discovery has prolonged thousands of lives and obviated many millions of days of pain and suffering. The human mind can form no just estimate of what has been added to man's happiness and comfort by the labours of this great benefactor of the human race. He has taught us that if we wish to live we must be clean; that nature loves the pure, the clean, the undefiled. Following his methods, we now perform operations with confidence and success that in pre-aseptic days would certainly have been followed by death. We are now able to preserve damaged parts, retain important functions and supply deficiencies that would certainly have been sacrificed prior to his time. The apostles of science know no rest, and what advances may be made in the future I cannot conceive. But of one thing I am satisfied, that man must go ahead; he could not go backward if he would; the struggle for higher realities will ever remain. Electricity is still in its infancy; it is but the toy with which science has been amused. In the near future we may look for wonderful achievements; we will have a wider culture, a higher standard of literature, of art and of medical science. During the years that medicine was making such rapid strides, the specialist grew with great rapidity, but we need not fear; if there has been an overgrowth, old Father Time will effect the cure. The general practitioner still exists and will continue to live.

It now becomes my duty, on behalf of the medical profession of Canada, to extend to the members of the British Medical Association a most cordial and sincere welcome. We are fully aware of the importance of their meeting and of the honor conferred on ourselves and on our esteemed and distinguished countryman, the president, Dr. Thomas G. Roddick. I am sure that the citizens of this city, who are noted for their hospitality, and all Canadians will do their utmost to make their stay in this country as pleasant and profitable as possible. As the circumstances under which we meet to-day are somewhat unique, I may be pardoned if I again digress to some extent from the line pursued by my illustrious predecessors. I am led to believe that the members of the British Medical Association have come here from across the sea, not alone for the purpose of ascertaining what we know about medicine, and of imparting further knowledge, but they have come as true physicians and scientists who labour for the benefit of humanity and who desire to obtain a knowledge of all and every

fact and means, calculated to better the condition of the human race. I hope that ample occasion may be given the distinguished visitors not only to gain a knowledge of our educational institutions, and their value; but that they may have an opportunity of seeing how our people live, how we are housed, clothed and fed, and of becoming acquainted with the laws by which we are governed. Much as we may desire to have our guests see all they possibly can we know that they at best, can only gain a limited knowledge of what we possess. We can only tell them that we own three million five hundred thousand square miles of territory; that we have one million three hundred thousand square miles of wheat growing country, an area capable of giving homes to fifty million farmers.

I sincerely hope that they may be able to gain a knowledge of our great rivers, our forests, our water falls, our mountains, our inland seas, our prairies, and our mineral deposits. We have also any kind of climate the heart of man could wish for. Five million souls comprise our present population. Commencing at the Atlantic we follow the sun to the Pacific, upon our own magnificent railway, across a continent of unknown wealth and happy homes. In this country we give to every man the fruit of his labour. This is a country of freehold farms. The avenues of distinction are open to all. The man possessed of ability and industry may climb to the highest position. This is a country of great possibilities; our present Premier is a lawyer, our late Premier a doctor, his immediate predecessor a printer, while a few years ago we had a stone-mason holding the position of Prime Minister, each of them loyal and patriotic, reflecting honour upon himself and his country. I trust that the members of the British Medical Association may be impressed with what we offer to men of industry, in the wheat fields, or the mines, the shops or the professions. I cannot but feel that the knowledge obtained during their visit will result in a large increase in immigration, and that we will ere long find thousands of British subjects flocking to Canada, where they may under their own flag hew out happy homes for themselves and their families.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI. SEPTEMBER, 1897. No. 3.

BRITISH MEDICAL ASSOCIATION.

Thanks to the most courteous co-operation of the British Medical Journal we are enabled to publish *in extenso* the full series of general addresses delivered before the British Medical Association at its meeting which, as we issue this number is drawing to a close. At the same time we publish the thoughtful address of the President of the Canadian Medical Association, Dr. V. H. Moore.

That the British Medical Association, an association embracing all quarters of the world, should hold its first colonial meeting in Montreal, the medical centre of the Province of Quebec, is but right and fitting. For this Province of Quebec is a very keystone of the Empire, and its history has determined that of the whole Anglo-Saxon race on this continent.

When all this is taken into account our meeting gains a peculiar significance. We have met together, Britons and French—Britons of the Empire and of the Republic ; French also of the Empire and of the Republic. For the French Government, mindful of the past, has honoured us by sending Professor Ch. Richet as its official representative and Professor Richet is a host in himself.

The occasion is a memorable one, and we, as Editors of this Journal desire to signalise it worthily.

We propose within the next few months to publish a complete account of the proceedings of the meeting and through the co-operation of the Editor of the British Medical Journal, such of the papers as are likely to prove of interest to our readers.

SUMMARY OF VIEWS EXPRESSED AT THE DISCUSSION ON SERUM DIAGNOSIS AT THE MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT PHILADELPHIA.

The committee appointed by the Chairman of the Section on Practice of Medicine make the following report:

1. In selecting the material used in making the test the choice between: *a*, serum, *b*, dried blood, *c*, fluid blood, and *d*, blister fluid, will depend largely upon whether the object be scientific research, clinical diagnosis in hospital or private practice, or public laboratory diagnosis where the samples have to be sent some distance.

2. In spite of considerable variation in technique, there has been a remarkable uniformity in the results obtained by those taking part in the discussion, and their average of about 95 per cent, of successes agrees with the general average of the cases, nearly four thousand, thus far recorded in medical literature.

3. Each of several methods of technique advocated may thus give good results in the hands of those thoroughly familiar with the details found necessary in each case and the sources of error to be avoided, success depending rather on being perfectly familiar with one method than on the particular one selected

4. For routine diagnostic work even the very simplest methods may give good practical results, but for recording scientific observations those methods which are accurately quantitive should be selected. This is especially necessary in reporting exceptional cases at variance with the general results recorded or where the observations are made the basis of generalizations.

5. A complete reaction should comprise both characteristic clumping and total arrest of motion occurring within a definite time limit. For practical diagnostic work a dilution of 1 to 10, with a fifteen minute time limit, is convenient. In any doubtful case the dilution should be carried as far as 1 to 50 or perhaps 1 to 60, and a reaction not obtainable at that point should not be regarded as perfectly conclusive. For these higher dilutions the time limit should be extended to two hours.

6. Intensity of reaction in a given serum should be estimated by determining the degree to which it may be diluted without losing its power of giving a decided reaction, both as to agglutination and loss of motion.

7. The intensity of reaction shown by the same serum is influenced by the age, condition and virulence of the test culture and by the

composition and reaction of the culture medium. For purposes of comparison the sensitiveness of the test culture should be taken into consideration.

8. The evidence so far recorded establishes that the reaction may be delayed or occasionally may not be obtained in cases of genuine typhoid infection; and also that it may be exceptionally present in non-typhoid cases, though not in an intense degree.

9. In investigating exceptional and contradictory results the following circumstances have to be considered: *a.* The uncertainty of clinical diagnosis. *b.* The absence of bacteriologic or other confirmatory methods of diagnosis during life, giving decisive *negative* results. *c.* The possibility of overlooking typhoid infection even postmortem, in the absence of characteristic intestinal lesions where a very thorough bacteriologic examination has not been carried out.

10. The modifying influences mentioned above suffice to explain the divergencies existing in the reports of different observers. Without being absolutely infallible the typhoid reaction appears to afford as accurate diagnostic results as can be obtained by any of the bacteriologic methods at our disposal for the diagnosis of other diseases. It must certainly be regarded as the most constant and reliable sign of typhoid fever, if not an absolute test.

N.B.—The above summary, while expressing the general consensus of opinion brought out during the discussion on serum diagnosis before the Section on Practice of Medicine of the AMERICAN MEDICAL ASSOCIATION, does not claim to represent exactly the individual views of any one of those who took part.

W. H. WELCH,	E. B. BLOCK,
WYATT JOHNSTON,	H. M. BIGGS,
J. H. MUSSER,	N. S. DAVIS, JR.,
R. C. CABOT,	M. W. RICHARDSON,
S. S. KNEASS,	J. B. HERRICK,
A. C. ABBOTT,	A. R. GUERARD,
J. M. SWAN,	A. P. OHLMACHER,

Committee.

—*Journal of the American Medical Association.*

The Scientific Grants Committee of the British Medical Association have awarded a grant of £30, to Dr. Hamilton E. Wright, the Medical Registrar, of the Royal Victoria Hospital towards the expenses of his researches into the Pathology of the Central Nervous System.

NEW BOOKS, ETC., RECEIVED AND NOTED.

International Clinics. Vol. 2. Seventh Series, Lippincott, Phila.

Ventral Hernia resulting after Abdominal Section and its treatment. By Andrew F. Currier, M.D., New York. Reprint from Annals of Gynæcology and Pediatry, July, 1897. Vol. 10. Boston.

The Johns Hopkins Hospital Reports. Vol. 6. Baltimore, 1897.

The Hemiplegic State and its Treatment. By Archibald Church, M.D. Reprint from The Chicago Medical Recorder, June, 1897.

Neurological Progress in America. By C. H. Hughes, M.D. Reprint from The Alienist and Neurologist. July, 1897.

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Presidential Addresses British Medical Association.

THE SECTION OF MEDICINE.

STEPHEN MACKENZIE, M.D., F.R.C.P.

Senior Physician to, and Lecturer on Medicine at the London Hospital.

On the Influences that have Determined the Progress of Medicine during the Preceding Two and a Half Centuries.—On this very interesting, and indeed, unique occasion, when the British Medical Association meets for the first time on Canadian soil, the mind is irresistibly led to compare the condition of medicine at the present day with that which existed when Europeans first settled in Canada, and to trace the paths by which progress has been made. When Maisonneuve and his companions landed in what is now the Custom House Square in Montreal in 1642, and when shortly after, the first hospital was established by the missionary priests, medicine was in a rudimentary stage. Though anatomy had been prosecuted for some centuries, chiefly on the European continent, it formed no part of ordinary medical education ; physiology in the scientific sense was unborn, and organic chemistry not yet created. The medical teaching of that day consisted mainly of the ancient doctrine of the four elements and their corresponding temperaments ; of the separate functions of the vegetative, sentient and rational souls ; of the agency of the natural, vital and animal spirits, that had continued to be taught with very litle variation from the time of Galen. It was an age of Aphorisms, Definitions, Systems and Nosologies. Medical opinions were so dominated by theories and burdened by the weight of authority, that the phenomena of disease for the most part passed unnoticed, and its teachings neglected. Such knowledge of medicine as the enterprising members of the medical profession who accompanied the early expedition to Canada possessed, must have been of the most elementary character, gained by apprenticeship under teachers whose

knowledge consisted in the doctrines of Hippocrates and Galen, and such crude experience as they themselves had obtained. Without doubt they were as zealous and earnest in their professional duties as we as a profession are to-day, and their treatment was as certainly unfettered and unrestrained by any scepticism as to the theories they had been taught, or doubts as to the efficiency of their remedies for disease. But this period was the dawn of a new era in science and medicine. Harvey's great work "On the movements of the heart and blood" and Bacon s "Novum Organon" had recently been given to the world, and the seventeenth century was a time of the greatest activity and discovery in geography and in science.

What a gulf separates that medicine of 250 years ago from that of to-day! In tracing how it has been bridged, it is right that we should justly apportion the influence that various spheres of activity have exercised in reaching our present position.

The Study of Anatomy—We must in the first place ascribe the greatest importance to the study of anatomy. Vesalius and Sylvius, Fallopius and Fabricius had already advanced it to a very high point, but the study had been confined to the leisured few. Gradually our knowledge of every detail of naked eye anatomy has been gained, and at the present time every one practising medicine must have a competent knowledge on the subject gained by dissection. The same systematic study has extended to Comparative Anatomy, and great, for its time, as was the knowledge of Aristotle it has undergone an entire revolution by the application of scientific methods to increased data of information by such workers as Cuvier, Darwin and Owen, It is now taught as a branch of medical education. Physiology could have no scientific basis until anatomy was fairly advanced. The facts on which it was at first based were founded on medical observations, but in the seventeenth century direct observations and investigations were commenced by Haller, Hunter, Spallanzani and Hewson. It has since been prosecuted with the greatest energy and success, and the position of physiology at the present time is that of a science, explaining the action and interaction of the organs and tissues, and the forces of the body which are the true foundation of scientific medical knowledge—the institutes of medicine. Morbid Anatomy could not exist until normal anatomy was fairly complete, but from that time, in the eighteenth century by the laborious researches of Morgagni and numerous other workers until now the broad facts of Morbid Anatomy have been accumulating until we have at the present day a fairly accurate knowledge of the principal pathological changes found in the body. The rise of physics and chemistry in the seventeenth

and eighteenth centuries contributed greatly to the progress of medicine, by increasing our powers of "searching out the secrets of nature" by methods and instruments of precision.

The Study of Histology—Of any one influence that has helped the advance of scientific study and the progress of medicine probably the increasing perfection of the microscope has been the greatest. With each new development of this instrument a greater range has been given to our researches, and, with the assistance of chemistry, it is continuing to reveal to us fresh facts that have created new branches of science. Starting from the observations of Bichat on the minute-anatomy of the tissues in 1801, the microscope has enabled us to understand the details of structure which were essential to complete anatomy. Until the microscope was capable of practical use the capillaries could not have been discovered by Malpighi, nor the composition of the blood understood ; the mechanism of renal secretion could not be worked out until the minute structure of the kidney was known ; the functions of glands, the process of digestion and secretion could not be understood until the histological details of the parts concerned were ascertained ; the mechanism of light and hearing, of taste and smell, were not revealed until the ultimate details of the structures involved had been investigated ; the marvellous complexity of the nervous system, whether in the delicate though comparatively coarse structure of the nerves, the higher intricacy of the spinal cord, and the marvellous details of the arrangement of ganglionic cells and communicating fibres of the cerebral tissue, which by improved methods of preparation and staining are being revealed to us at the present time, could not have been worked out without its aid. Just as anatomy had to reach a certain stage before physiology and morbid anatomy became possible, so normal histology had to advance before pathological histology could come into existence. And, as knowledge advances from the special to the general, special pathological histology had to reach to a very bigh point before we could reach that knowledge of general pathology on which our conceptions of the nature of disease are at present based.

What would Harvey have given to see the capillaries that completed the "circle" of the blood stream, or to have watched the process of inflammation in the exposed mesentery of the frog by the aid of the microscope—to see the contraction followed by dilatation of the blood vessels, the escape of blood corpuscles through the walls of the vessels ? What a vastly different conception has the reader of Cohnheim's Lectures on General Pathology to that of the most advanced and profound investigator and physician of two and a half

centuries ago. The microscope again has introduced us to a new world, revealing minute organisms that play a great part in the plan of nature and which are largely concerned in the production of disease. It has led to a new department of science, bacteriology, which has taught us how bacteria enter the body, how they increase and multiply therein, and of the reaction of the tissue for self protection. Chemistry has shown how the poisons formed by such organisms act in the body and supplied us with means, as yet only in their infancy, for counteracting their effects, or guarding against their entrance by their exclusion and by protective inoculation. The microscope has further furnished us with evidence of parasitism, other than bacteria, in the blood, in the muscles, in the skin and hair, and on the mucous membranes. By its aid we are able to diagnose and watch the course of several primary diseases of the blood. It has enabled us to differentiate the various new growths that develop in our bodies. So much does the microscope constitute a necessary means of research that it would be impossible to conscientiously perform our daily medical duties without its aid.

Clinical Instruments of Precision—The thermometer again has been of invaluable aid in the study of disease, allowing of our measuring and recording the degree of fever, and of watching its progress with such a degree of accuracy as to furnish us with evidence of the greatest value in the diagnosis, prognosis and treatment of disease. Electricity, by the laborious and complete investigations of Dubois-Reymond, has revealed to us the mode of action of nerve and muscle that would have been impossible to obtain in any other way. Though the hopes at first entertained of its value in the treatment of diseases have not been altogether fulfilled, it is still of much service in this respect, and perhaps still more valuable as an aid in diagnosis.

The ophthalmoscope, introduced by Helmholtz, has enabled us to understand diseases of the interior of the eye, which without its assistance was impossible. It has admitted of the exact examination of refraction, and has revealed changes in the termination of the optic nerve, in the retina and choroid, not only valuable in themselves, but so important in the light they throw on pathological changes occurring in the nervous system, and in the body generally, that the use of this instrument has become a necessity of practical medicine.

The laryngoscope, perfected by Czermak, has given precision to the diagnosis and treatment of diseases of the throat not otherwise attainable, and which has important bearings on general medicine, by the recognition of paralysis of the muscles that move the vocal cords in aneurism and in disease of the central nervous system.

The sphygmograph, the cardiograph, the arteriometer, and, the latest invention of this class, the sphygmometer, by enabling us to ascertain the exact condition of the circulatory system are of the greatest service, not only in studying the problems of normal and abnormal physiology, but in the recognition of disease and its tendencies, and in the influence of remedies.

Auscultation.—Nothing from the time of Harvey gave such an impetus to the study of exact medicine as the introduction or discovery of auscultation by Lænnec in 1816 ; and, indeed, Harvey's great discovery had little practical application in clinical medicine until its introduction. Auenbrugger had introduced percussion in 1761. Lænnec had adopted it, and his discovery of auscultation with his zeal as a morbid anatomist, enabled him to work out most of the great problems of diseases of the thorax. The knowledge thus begun has, by the labours of many workers, increased in range and accuracy down to the present time, and the diagnosis of diseases of the chest has reached a degree of precision unequalled in any other department of practical medicine. We are now able not only to recognize disease of each of the valves of the heart, but to estimate its degree, and the influence of the lesion on the greater and lesser circulations and to trace the course and effects of emboli carried along the blood stream. Our knowledge of diseases of the lungs is nearly as complete as that of the circulatory system.

Vaccination—During the period that bridges the time from when Canada first became populated by Europeans to the present day probably no discovery has exercised a greater influence in medical science or conferred more lasting benefits on mankind than the introduction of vaccination by Jenner. It is not necessary in such a meeting to trace how Jenner was led to his discovery. Protective inoculation from smallpox by the introduction of the smallpox matter had long been known in the East, and had been introduced into England by Lady Mary Wortley Montagu, but Jenner's rare merit consisted in testing the statement made to him by Gloucestershire rustics, by scientific methods and experiments ; and by waiting for years until the value of the protection the " variola vaccinia," introduced by inoculation into the human subject, had been tested by exposure to contagion from smallpox, and until time had elapsed to demonstrate that this protection was no ephemeral influence, but of more or less permanent duration as much as that of an attack of smallpox itself, " I never expected it would do more, and it will not, I believe, do less," are Jenner's words. It was not until many years after he had satisfied himself as to the protective influence of the vaccine virus that

Jenner in 1796 published his observations. It is needless to trace the effects this discovery has had in saving human lives, and in averting the disfigurements with which those who escaped death from the disease were almost invariably afflicted. It is probable that the full significance of his discovery was not revealed to Jenner himself, and on the other hand it is possible that he exercised self-restraint in not speculating as to the possible result that might accrue from his remarkable inquiries. Certain it is that the indirect results that have followed from Jenner's discovery that an attenuated virus was protective against contagion from the disease from which the virus was originally obtained have only recently been fully utilized. Probably several causes have been concerned in the want of continuity of progress in this direction, the most important of which has been the difficulty in isolating and handling the virus in many contagious diseases. The investigations into the full extent of the value of inoculation with attenuated virus and derivatives of bacteria have only been commenced in the last few decades, since bacteriology has been cultivated by Pasteur, Lister, Koch, Klein, Gaffkey, Martin, and others, and the whole subject with the aid of organic chemistry made a branch of exact science. Bacteria are now classified by their morphological qualities, by their reactions to staining reagents, by their modes of growth in various media, the temperature at which they grow and at which they are destroyed is determined, their need of oxygen ascertained, the parts of the body they make their habitat studied, the effects of their invasion in the tissues, and the protective powers of the organisms observed. The chemical products to which they give rise are isolated, their nature ascertained and their effects observed on the living body independently of that of the organisms by which they are formed. Finally the knowledge thus obtained is turned against the bacteria. The virus is attenuated by various methods, often by passing through the body of an animal immune to the disease, and its exact strength ascertained. It is then used for protective inoculations or for antidotal purposes in those already attacked by the disease from which the virus was originally obtained. Jenner's and the recent researches are equally scientific, observation, induction, experiment—but the differences in carrying out the inquiry on smallpox by Jenner and that of any specific disease due to an organized virus, at the present time, illustrate my theme of how the progress of medical science has been effected. Great as it has been and precise as a rule as are our methods of research, it is remarkable that up to the present time in two diseases in which protective and curative inoculations have been most conspicuously successful, namely,

smallpox in which we had, thanks to Jenner, the first vaccine, and in hydrophobia in which Pasteur succeeded in attenuating the virus and using it as antidote, we have not succeeded in finding the micro-organism that is the true virus, unless, indeed, Copeman Monkton has at length done so in the case of smallpox and vaccinia. As a matter of fact this organized virus has yet to be discovered in many of the most common specific communicable diseases, but the knowledge gained by the study of some members of this class in animals, and of some, *e.g.*, diphtheria in the human subject has afforded a basis of knowledge applicable to the whole group.

There is one other branch of medical science which has been incidentally alluded to in the previous remarks, but which requires fuller recognition in the survey of the influences that have governed our progress. I allude to Experimental Investigations in Animals. In the Seventeenth Century, in the hands of Harvey and others, but more especially in the Eighteenth by the labours of Hunter and others, and in the Nineteenth Century, this method of observation has been the basis of normal physiology, and later of abnormal physiology or pathology and therapeutics. These investigations enabled us to reach a degree of knowledge not obtainable in other ways, not only of value to man, but also to the lower creation.

Therapeutics.—Until the exact nature of disease is fully understood, a truly scientific treatment is manifestly impossible. I need not discuss how entirely in the past but also at the present day, our knowledge of treatment has been mainly empirical. It could not be otherwise. It is true that up to the present time scientific therapeutics only influence our treatment to a small extent. But, looking back, as we have been doing, to the course of progress in medicine, we have seen that it has throughout followed the line of patient and exact research. The action of drugs is now studied with the same care and precision that have been employed in physiology and pathology, and we are yearly adding to the stock of exact knowledge of the action of remedies. The scientific application of this knowledge will come with a more complete understanding of the cause of the disease, increased knowledge of pathology, and greater precision in diagnosis. But therapeutics is not coterminous with drug treatment. It includes all the circumstances of the management of the sick, the surroundings, the feeding and general care of the patient. In all of these respects enormous strides have been made, which greatly influence the chances of recovery of the patient of to-day. Moreover, therapeutics includes prophylaxis, the prevention of disease. It is in preventive medicine that the greatest triumphs of medicine have been and will continue to

be gained. The work of Jenner, Pasteur, Lister, Koch and other pioneers of preventive medicine, has saved more lives, probably, than remedial art can claim. Fresh fields of therapeutical triumphs are opening to us in the employment of antitoxin serums and extracts of animal secretions, so that if therapeutics has lagged behind other branches of medical science, it has been due to unavoidable causes, and we may look forward hopefully and confidently to its future.

The Growth of the University System.—We must not leave out of consideration in tracing the path of progress the remarkable development of the University system in all civilized countries, and the increased care and methods of medical teaching.

All the branches of scientific knowledge we have been considering, anatomy, and physiology, chemistry and physics, morbid anatomy and pathology, therapeutics, and preventive medicine have helped us to the knowledge we at present possess. But they have rendered a further aid to medicine than the mere knowledge they enabled us to acquire. Themselves scientific studies utilising methods and instruments of precision they have influenced our whole mode of thought and made us exact and precise in our observations and investigations of disease. We may paraphrase an expression of Burdon-Sanderson's "The history of modern medicine is largely the history of scientific method." So when we are taunted with the assertion that medicine is not a science, we can reply that medicine utilises the knowledge gained in every branch of science, and is scientific in its methods of research into the nature and treatment of disease. If its results are not so exact as in some other branches of knowledge it is not due to any want of scientific method and care in its investigations, but to the very complicated phenomena with which it has to deal, whilst the investigator has not the same unfettered freedom of dealing with his subject that the investigator into chemistry or physics has. By a continuance of the same methods and exact research we cannot for a moment doubt that the progress that has been so manifest in the past will be exceeded in the future.

Clinical Medicine.—If we turn now to Clinical Medicine we shall see what great strides in progress have been made. It is only possible to give a few illustrations in the time at my disposal.

Fevers.—One of the most important advances in clinical medicine has been the separation of enteric from typhus fever by the labours of Jenner, A. P. Stewart, Murchison, Liebermeister and in America by Stuart. Relapsing fever has in like manner been separated from the other fevers by Barker and Cheyne, by Graves and Stokes, whilst in 1873, Obermeier described the spirillum in the blood of this disease

at that time the only instance in which a specific organism in the blood was proved to be always present in fevers. Quite recently by the labours of Laveran and Marchiafava, Celli and Golgi, Councilman and Osler, after previous unsuccessful attempts by Salisbury and Balustra, Klebs and Tommasi-Crudeli, it has been conclusively proved that a microscopic parasite, the plasmodium malariae, is the actual cause of malarial diseases that are so common and destructive in some parts of this continent and in other parts of the world. All these gains to clinical medicine, so important in the recognition and treatment of disease have been due to increased precision in clinical observation and Morbid Anatomy, aided in a high degree by the use of the microscope.

Diseases of the kidneys.—It may be safely asserted that two and a half centuries ago nothing was known of diseases of the kidney except the facts of the very coarsest lesions, such as calculus and suppuration. Even these were very imperfectly connected with their clinical manifestations. The detection of albumin in the urine by Cotugne in 1770, followed by the observations of Wells and Blackall, but more especially the work of Richard Bright, who combined in a rare degree the powers of accurate clinical observation and diligent post mortem research, furnished a new vantage ground to the study of clinical medicine. The continued researches of many of the ablest physicians in all countries, who have availed themselves of each new discovery and perfection of instruments of exact investigation, have brought our knowledge to a very high degree of perfection on this subject. The recognition of the association of increased arterial tension with renal disease, and the far reaching effects of this in the production of cerebral hæmorrhage and other consequences, has been one of the triumphs of modern medicine.

Diseases of the nervous system.—The gradual unfolding of the closed book of the nervous system, by the successive gains in our knowledge of its anatomy and physiology, the invaluable work of Sir Charles Bell and Marshall Hall, the histological researches of Caskell, the clinical and pathological work of Charcot and Westphal, the experimental work of Fritz and Hitzig, of Ferrier, Bevor. Victor Horsley, and others has helped us to understand in a great measure the working of the nervous system and the effects of its lesions. But Clinical Medicine may justly claim to have had a large share in aiding us to reach our present knowledge of its workings and disease. The deductions of Hughlings-Jackson and Broadbent, and the recent valuable work by Starr, Edward Head and Thurston have greatly increased our knowledge of the physiology of the nervous system and aided us

in our means of diagnosis. Improved methods of surgical technique, especially the advent of antiseptic surgery by the genius of Lister have brought some of these into the region of curative treatment.

Addison's disease.—The discovery by Addison of the association of asthenia, gastric irritation and pigmentation of the skin with diseased changes in the suprarenal bodies will always remain a model of good scientific work, combining clinical and pathological observation. At the time when Addison recorded his observations no definite functions were ascribed to the adrenals, and he could do no more than draw attention to the association of the clinical and post mortem conditions. The full fruition of his discovery was to come later when it was established that the suprarenal bodies formed a secretion which supplied to the circulation, probably through the vasomotor centres, a stimulus or tonic necessary for the maintenance of health, and that the asthenia which is the cause of death in Addison's disease is due to the deprivation of this secretion by destruction of the adrenals.

Myxœdema.—In the developments of our knowledge of this condition we have one of the most completely worked out sections of medical knowledge, and the manner and modes in which our knowledge has been gained is most instructive. Starting from the recognition of endemic cretinism in regions in which goitre is prevalent, we next have the observations of sporadic cretinism in England by Curling, who noted that the thyroid gland was ill developed or absent in these cases. Then came the description by Gull of "a Cretinoid State supervening in Adult Life in Women." Later followed a communication by Ord, in which he pointed out that the changes in this disease were due to a mucin-yielding œdema, and who also noted the atrophy of the thyroid body, and discussed its relations to endemic and sporadic cretinism. He gave to the disease the name of myxœdema, which it has since been known by. Next the observations of Reverden and Kocher that a condition similar to myxœdema was apt to follow upon total extirpation of the thyroid gland for the cure of goitre. The latter called this condition "cachexia strumapriva." Semon pointed out the identity of myxœdema, cachexia strumapriva and cretinism, and that each was dependent on a loss of function of the thyroid body. Paul Bruns published a case in which the extirpation of the thyroid gland of a boy, aged ten, had been followed by the condition hitherto described in this country as sporadic cretinism. Then Victor Horsley by experimental research on animals succeeded in demonstrating that loss of function of the thyroid gland produced all the symptoms known as myxœdema and strumapriva, and varying the mode of experimentation obtained strong evidence that cretinism

was a more chronic form of the condition. Finally came the crowning of the edifice by Horsley proving that transplantation of the thyroid gland arrested the changes, by the same results being obtained by Murray by subcutaneous injections, by Hector Mackenzie, by feeding with the glands, and lastly by other observers by the internal administration of an extract of the thyroid body. By these means we have learnt that myxœdema and sporadic cretinism can not only be kept at bay but that in the latter class of cases a remarkable growth and development can be brought about. Thus it has been shown that the thyroid gland, and probably every other ductless gland removes or forms certain products in the body and that the integrity of those glands is essential to the well-being of the individual. This knowledge is being turned to account in the treatment of quite a number of conditions. It is interesting to observe how these results have been acquired by the steady progress of scientific methods of observation and research, and to my mind the Report of the Myxœdema Committee of the Clinical Society of London, which embraces most of the above facts, is one of the most instructive contributions to medicine, by showing how each of the great branches of medical science has contributed to the result.

Conclusion.—The question may be asked, have the great and undoubted advances in Medicine been attended with any benefit to mankind. To this question no uncertain answer will be given. Human life has been prolonged, and not only is this so, but as brought out very clearly by Dr. James Pollock, from the figures of Mr. Noel Humphreys, several years have been added to the most useful and valuable period of life. There has been a manifest decrease of mortality from smallpox, scarlet fever, diarrhœa, typhus, enteric fever, phthisis, convulsions, croup, diseases of the digestive system, and puerperal diseases, etc. On the other hand there has been an increase of mortality from cancer and some other diseases. The gains have been greater than the losses, and this is not the occasion to discuss why we have failed in this direction.

But whilst the review we have taken of the progress of the science and art of medicine is encouraging, we must remember there will always be a limit to our powers of curing disease. When any part of the higher tissues is destroyed it can never be replaced by the recuperative powers of nature or improvements in medical science Sclerosis and destruction of the nervous elements means that they are almost irremediably lost. If the lung is destroyed by tubercle or other disease it can never be replaced. Nothing can make good disintegration of the kidney or liver. Nor shall we be ever able to retard the

effects of time. "To die is as natural as to be born" it has been truly said, and the silver cord that chains us to this world must sooner or later give way. Great as have been the improvements in the treatment of disease, our greatest triumphs, in the future as in the past, will continue in the prevention of disease.

One of the most important features in modern medicine has been the remarkable development of Medical Societies and Associations, and the fact that they are yearly increasing is strong evidence that the profession finds them useful in its work. They enable us to submit our observations and inquiries, our theories and our practice, to the criticism of those most competent to discuss them and thus to separate the wheat from the chaff. The meetings of the British Medical Association amongst others have been most useful in this respect. Let me conclude by expressing a hope that the work done at this Meeting at Montreal, and especially this Section of Medicine, will aid in the search after truth, will stimulate and ennoble the aims and energies of those taking part in its proceedings, for the advancement of knowledge and the good of mankind.

THE SECTION OF SURGERY.

CHRISTOPHER HEATH, F.R.C.S.,

Holme Professor of Clinical Surgery in University College, London, and Senior Surgeon of University College Hospital.

On the Teaching of Surgery—In taking the chair at this, the opening meeting of the Section of Surgery, allow me to express my sense of the high honour I enjoy in presiding here to-day. It is no small matter for an English surgeon to be called upon to preside over colleagues of such eminence as are represented by the Vice-Presidents of the Surgical Section, and I beg leave to tender to them, and to the eminent surgeon who is President of the Association, my thanks for having selected me for so distinguished a position. As an English surgeon it gives me the greatest pleasure to meet the members of the profession in the Canadian portion of Greater Britain, and also those medical brethren from the United States who have been good enough to attend this meeting. I trust our deliberations will not merely advance the science of surgery, but will cement those bonds of fellowship between the members of a united profession, which our common Anglo-Saxon origin should foster and maintain.

In addition to the various papers which will be read in the Surgical Section, it has been thought desirable that there shall be held two discussions on questions of surgical interest ; and after considerable deliberation it has been decided that these shall be : (1) Appendicitis and its Surgical Treatment ; and (2) the Treatment of Cancer of the Rectum with special reference to High Operation. The Honorary Secretaries have arranged with certain eminent surgeons to introduce these subjects, one this morning and the other to-morrow, and I trust that the discussions will be well supported.

Nothing, I venture to think, is more remarkable than the recent progress of abdominal surgery. Twelve years ago I was engaged in editing a *Dictionary of Practical Surgery*, and neither appendicitis nor the operation for the removal of the rectum, with which Kraske's name is connected, was mentioned in it, although I had the assistance of the leading London hospital surgeons. Kraske's original paper, I may mention, was published in 1885, and is referred to in Ball's work on the rectum, published in 1887, and in most surgical works since that date. The subject of appendicitis, so far as British surgery goes, dates from a paper read before the Royal Medical and Chirurgical Society in February, 1888, by Mr. Frederick Treves, though the title

of it was *Relapsing Typhilitis Treated by Operation.* In August of the same year Mr. Treves opened a discussion on the Surgical Treatment of Typhilitis, at the meeting of the British Medical Association at Leeds, and subsequently published his address with additions and alterations, in the form of a monograph, entitled *The Surgical Treatment of Perityphilitis.* I do not know to whom we are indebted for the hybrid term " appendicitis," but it did not appear in the index to the *British Medical Journal* before 1891.

But it is not merely in these two departments that progress has been made. The surgery of the kidney and of the liver has advanced *pari passu* with that of the hollow viscera, and the labours of Morris and Robson in England, and of Keen and others on this side of the Atlantic, have done much for the relief of suffering and the prolongation of life.

Looking back over forty years of professional life, nothing surprises me more than the change which has come over the treatment of calculus. In my student days, to see Ferguson cut for stone by the lateral method was to witness an operation as near perfection as was conceivable, and the dexterity and rapidity with which the calculus was extracted were only marred by the frequency with which death from septic causes spoiled the skill of the surgeon. To have one's first lithotomy was an event in the life of the young surgeon, and every now and then a reputation was spoiled by some *contretemps* in the public performance of the operation. Later, I was the frequent witness of my colleague Henry Thompson's skill in using the lithotrite to break up the calculus in a series of " sittings." Then came in " litholapaxy," or rapid lithotrity, which we owe to Bigelow, the great American surgeon ; and, lastly, that recurrence to the old high or suprapubic operation which was due to the Scandinavian surgeon Petersen. Hence the student of to-day rarely, if ever, sees a perineal lithotomy, and as a consequence his interest in the anatomy of the parts concerned in the operation has greatly diminished. Possibly the surgeons of the last generation laid too much stress upon anatomical details, but it is somewhat remarkable to find how little anatomy seems to serve for practice in the present day.

I am told by those who are teaching anatomy now that it is difficult to get the student to take the trouble to make a neat dissection, because he can find in the various museums, and notably at the College of Surgeons of England, such beautiful preparations in spirits that he prefers to study from them, or from pictures rather than labour to get out the details for himself. If this is so I can only

regret that the present race of students is so short-sighted, for without a working knowledge of human anatomy I can conceive of no progress in surgery.

But I regret to find that, in Great Britain at least, the teaching of anatomy is gradually getting more and more into the hands of professors who are anatomists but not surgeons, and that their tendency is to lay stress upon transcendental details rather than surgical relations. When these gentlemen happen to become examiners, this tendency to specialise become very marked, and as this applies equally to the teachers of physiology and chemistry, the unfortunate medical student becomes the victim of science (falsely so-called) and sometimes develops into that marvellous being a London B.Sc.

But seriously, are we not overlooking the scientific teaching of the man who has after all to get his living as a practitioner of medicine, surgery and midwifery? When the medical curriculum was lengthened by a year it was hoped that the additional time would be devoted to clinical work, but I fear that this is by no means always the case, for it is not uncommon for the student to take three years in passing his primary examinations, with the result that but two remain for the study of medicine and surgery. When I became a student of medicine I took to heart the advice of my teacher of physiology, William Bowman, and never allowed a day to pass without visiting the hospital; and though as a lad of 16 I failed of course to appreciate the importance of all that I saw, yet I saw it, and I can carry my mind back now to cases seen and lessons learned in the early fifties which are of service to me at the present time. But the student is practically forbidden to enter the wards now until he has satisfied the examiners in anatomy and physiology, which he may or may not do in two years, and then there are but three years left for him to study *totam rem medicam*.

Far be it from me to decry the modern methods of teaching medicine in the wards of our hospitals. I believe that the care taken to induct every student into the mysteries of auscultation and percussion is beyond praise; and if with some teachers treatment is regarded as of secondary importance, at least the student has the opportunity of studying *vis medicatrix naturæ* untrammelled under one teacher, and of watching the effects of every new drug upon the human system under another. But all this takes time, and so also the elaborate manipulations of the gynæcological department, the researches of the pathological professor, and all the other teachings of the third and fourth years. And where, then, does surgery come in? Why, I consider myself fortunate if I can secure the regular

attendance of candidates for a surgical diploma for the last three months, when their names are put on my list, and I subject them to rigid surgical cross-examination. But if I venture to refer to an illustrative case of last year, I find that no one present saw it or even heard of it, though at the time the whole surgical staff may have been in consultation upon it. How, I ask, is it possible for the student to see the serious surgical ailments which are not very common, such as aneurysm, tumours of bone, tetanus, etc., if his attendance in the surgical wards is limited to a few months ?

And yet there has never been a time of greater activity in operative surgery, not only among hospital surgeons, but among general practitioners, who, thanks to anæsthetics and antiseptics, undertake operations of a magnitude which the hospital surgeon of the last generation would have hardly attempted. How are we to explain the apparent contradiction ? In the first place, I am afraid we must allow that a great many mistakes in diagnosis are made, or rather, that too often no attempt at diagnosis is made, but that an operation is undertaken to "clear up the case." That it generally does no doubt, but not always to the benefit of the patient. Then we must allow that with unlimited time for the anæsthetic, the least skilful surgeon may hope to bring an operation to a conclusion more or less satisfactory to himself, and, if he operates under fairly favourable circumstanees, for his patient also. Lastly comes the enormously increased opportunity for the publication of a success at one of the numerous mutual admiration societies and in one of the medical journals of the day. Can we wonder, then, that young surgeons whose stock-in-trade of professional knowledge is of the smallest, blossom rapidly into operating surgeons in some special department, and try not unsuccessfully to prove that all is fish which comes to their net ?

Still, gentlemen, the great foundations of the art and science of surgery remain undisturbed. Without a knowledge of anatomy, of pathology, and histology, progress in surgery is impossible, and it is for those who hold the important positions of teachers in our great medical schools to insist upon a foundation of scientific and practical training being given to our students if they are to become the successful practitioners of the future. The growing tendency of the non-medical teachers of collateral science to regard their particular subject as the most essential for the medical student must be restrained, and the preliminary period of medical study must be cleared of many obstructions if the student is to have the necessary time to devote to the thorough study of those strictly medical subjects which will fit him to be a sound practical, and at the same time scientific, physician and surgeon.

THE SECTION OF PUBLIC OR STATE MEDICINE.

E. P. Lachapelle, M.D.,
President of the Board of Health of the Province of Quebec.

The Progress of sanitation in Canada.—It is with the utmost pleasure that I offer you a warm greeting to Montreal, the metropolis of Canada, and the seat of the Board of Health of the Province of Quebec. By accepting the general invitation tendered you by the Montreal Branch of your Association, you have, in this year 1897, that stands out in golden figures in the annals of the reign of Queen Victoria, wished to judge *de visu* of the progress made in sanitary matters by the foremost of England's colonies. The hearty readiness and cordial grace with which you have responded to our call, honours us most highly and receives our sincere gratitude. Be assured that the presence among us of such learned and distinguished men as those we see assembled here, in this hall, this morning, fills us with legitimate pride, and will be a powerful motive of encouragement to us in the pursuance of our labours in the cause of humanity. Here, you must be at home; and it is with enthusiam that, in the name of the Sanitary Authorities of our Country, I wish you heartfelt welcome.

I shall not detain you long, and so, not protract the eagerness you feel to broach the subjects on to-day's programme. I shall, therefore, in the few minutes allowed me by the rules of the Association, briefly and rapidly expose to you the progress of Sanitation in Canada, presuming that on your arrival here, it would be interesting to you to be made familiar with the sanitary organization of this country. The present sketch is but a concise synopsis of a work which the patient and fertile investigations of Dr. E. Pelletier, the Secretary of the Board of Health of this Province, have permitted me to undertake, and which will shortly appear in a cyclopedia to be published in Toronto. I, therefore, beg you to grant me the first moments of this meeting during which I will rapidly analyse, trying to be clear and precise, all the sanitary legislating done in Canada, from Louis XIV, of glorious memory, up to the sixtieth year of the reign of our illustrious and most Gracious Majesty, Queen Victoria.

Hygienic measures under the French regime, 1603-1763.—One can hardly expect, at such a remote period and in a new country, to see hygienic measures occupy an important place in public administration. In its early days, Canada was, we may say, under the control of the "Peltry Trade," or the fur companies, who leased the country

from the King of France, as one would now rent a hunting ground, and who had, naturally enough, but one thought—that of deriving from the fur trade with the Indians the most advantageous results.

Nevertheless it is surprising to see with what precision and practical good sense certain sanitary questions were looked upon and dealt with during the reign of Louis XIV. Thus, in 1667, we find that the King of France, in one of those ordinances that were for so long the Civil Code of Canada, establishes for the Civil State a system of registration which is still in force in the Province of Quebec. It is the clergy who keep the registers of baptisms, marriages and burials, and they furnish the civil authorities with a copy of such. The King's ordinance reads: "There shall be kept in each parish two registers in which to inscribe the baptisms, marriages and burials; one shall remain in the hands of the parish priest, and be considered as the original; the other shall be turned over to the judge royal and recognised as the copy." This was taking, in the early days, an efficient means of following up the development of the Colony, and of realising its firm civil standing. As stated before, even to-day, in this Province, the same simple system is thought still sufficient.

A few years later on, the Superior Council of Quebec busies itself in a very enlightened manner with the question of foods. Thus, in 1677, it convenes a general meeting of the inhabitants to decide upon the inspection and price of bread. Again, in 1707, desiring to provide the inhabitants with meat of good quality, it passed inspection regulations equivalent to our modern stamping. No butcher could, under penalty of confiscation and fine, slaughter an animal without previously notifying the procureur of the King, or his representative, so that the latter might ascertain whether the animals were or were not in a fit condition to be distributed to the public. No farmer could bring into, or sell in, the city without first presenting to the procureur of the King, or his representative, a certificate from a judge, if there was one in the place he inhabited, or from the seigneur (or lord of the manor), the parish priest, or the officer of the militia, said certificate to testify that the animals brought in were not diseased before they were slaughtered and that they had not died of any such accidents as drowning or poisoning. It would be hard to do better, even now-a-days.

All the other regulations sanctioned at this period relate exclusively to the cleanliness of the streets and dwellings; some ordinances, however, revert to public morality. The King takes charge of foundlings, and allows nurses 45 livres for the first three months of nursing for each child, and 10 livres a month thenceforth, till the child has

attained the age of 18 months. The children are then bound over to honest citizens and countrymen, till they are 18 or 20 years old. (1748).

Sanitation under the British Rule.—Before the Confederation, 1763-1867.—Under the English domination, hygiene falls into oblivion for several years. After the cession of Canada to England, the greater part of the Canadian nobility returned to Europe; on the other hand, the British element increased and acquired more authority, thus forcibly causing for some time pronounced social perturbation. Next came the epoch of martial agitation, and the war with the United States, which engrossed public attention almost entirely.

The first preventive sanitary measures that spring forth are those necessitated by a new threatening danger—typhus fever. The typhus fever epidemic of 1795, in Ireland, demanded the urgent protection of the colony; so, vessels coming from infected ports were obliged to submit to an inspection, and if found necessary were quarantined. The captain was bound to hide nothing from the inspector, under penalty of losing his head, and suspected vessels were liable to be fired upon. However vigorous those measures may in appearance seem, they had the great fault, as to organization, of being but temporary, incessant renewal being thus required.

From 1815 to 1821 the Government appoints medical vaccinators, grants prizes for a memoir on the advantageousness of vaccination, and encourages the practice as much as it can; but without, however, rendering it compulsory.

Again in 1832, a new stimulus in favour of hygienic measures is generated by the appearance of cholera in the country; a delegation is sent to New York in order to examine the measures there employed; health boards are formed; a quarantine station is organized at Grosse Isle, the declaration of the disease is required, &c. Unluckily all this valuable organization ceases with the disappearance of the epidemic. In 1849, a second incursion of the disease does not seem to have made the legislation any the wiser, or to have induced more permanent organizations. But, withal, the law passed in that year is a statutory law, very precise, meeting the needs of the public in case of epidemics, and destined to remain in force; this law, in 1885, during the epidemic of variola, in this Province, was appealed to with the most desirable results. Nevertheless, all organizations established by this law of 1849, must, in accordance with this same law, vanish with the cessation of the epidemic.

We must recognize, then, that nothing stable, no permanent organization had been established under the British Domination, up to the Confederation.

Since the Confederation, 1867-1897.—With the advent of Confederation, we enter a period of positive systematization. The British North America Act defines the respective rights and powers of the Federal Government, as well as those of the Provincial Governments, and those bodies are not slow in adopting all measures to insure public safety. We will now review in a detailed abstract, the laws successively enacted at Ottawa and in the different provinces, in order that you may conceive their sphere of action and the extent of their effectiveness.

I. Federal Sanitation.—All matters relating to foreign countries and to commerce are of federal jurisdiction, and, accordingly, sanitary laws were passed at Ottawa in reference to immigration and quarantine, the prevention of contagious diseases in animals, the suppression of food adulteration and the compilation of statistics. Aside from the decennial census, however, this latter work is left almost exclusively to the initiative of the provincial authorities, who may be called upon to furnish Ottawa with a copy of their collations.

Ere the first year of the Confederation (1868) the Federal Government enacted an "Immigration Act" destined to be completed later on (1871) by the Quarantine Act, and rendered most effective by the laws of 1893. Actually, our ports are protected by eight well organized quarantine stations: Grosse Isle (Quebec); Halifax (Nova Scotia); St. John (New Brunswick); Sydney (Cape Breton); Hawkesbury Nova Scotia); Chatham (New Brunswick); Charlottetown (Prince Edward Island); and William Head (British Columbia).

The staffs of these stations see to the inspection and disinfection of vessels, to the vaccination of passengers, to the detention in quarantine, when required, &c. The frontier custom officers, especially those along the United States border-line, are, when necessary, required to act as quarantine officers.

With regard to contagious diseases in animals, the Federal statute (1884-1896) provides for the quarantining of exported animals, and for the repression of epidemics among animals. In no way, however, does it consider the transmissibility of disease from beast to man.

The "Adulteration Act" appoints food analysts to whom any person may submit samples; it also has some provisions respecting milk supplies and other foods (1884-1889).

Any trader offering for sale food that is adulterated or otherwise unfit for consumption, is liable to be prosecuted, according to the law.

To sum up, if we except the quarantine organization which is under Ottawa's exclusive control, it is easy to see that on other questions (vital statistics, contagious diseases in animals, food adulteration)

the provinces have a concomitant jurisdiction which may, as a legal constitutional right, be looked upon as somewhat doubtful, but which as a fact, they do exercise, thus completing federal legislation by provincial statutes.

II. Provincial Sanitation.—Moreover, the sanitary organization of Canada could not be at all complete, without the intervention of the provincial authorities; because Ottawa can act only on questions of commercial interest, or in order to protect the country from outside dangers. The prophylactic treatment of local contagious ailments, the sanitation of public and industrial establishments, of dwelling-houses and of schools, the routine food inspection: in a word, every means that refer to the preservation and protection of private and public health, and we may add, the compilation of vital statistics, must necessarily be based on the interference and activity of the provincial authorities, who, in their turn, must acquire the co-operation of the municipal boards.

In most of the provinces of the Dominion of Canada the local legislature has, by a statutory law, delegated its powers to a Provincial Board, charged with enforcing sanitary measures, and in whom, consequently, lies the authority. At the same time, the municipal authority, perserving their own independence, may make municipal regulations, and in most cases need the provincial interference only in a measure requisite to insure the exercise of their powers to the desired extent.

The law, however, varies on this matter in different provinces, as we shall see in a few moments, when speaking of Quebec and Ontario. It is to be noticed, also, that the Lieutenant-Governor-in-council, both in the Province of New Brunswick and in that of Nova Scotia, possesses a joint action with the Provincial Board, and he may also in certain cases (Nova Scotia) veto any measures taken by the municipalities. Certain Provinces, such as Manitoba and British Columbia, possess special organizations. Finally, the Northwest Territories and Prince Edward Island have no provincial boards of health, although there exist sanitary laws investing extended powers in the Lieutenant-Governor-in-council and in the municipal authorities.

Ontario and Quebec are, perhaps, the best managed Provinces; in any case, they are the ones in which the organization is the oldest. We will examine them conjointly.

The Provincial Board of Ontario was founded in 1882, that of Quebec in 1886. It is those two boards that have enabled public hygiene to make the greatest progress in Canada.

In Ontario compulsory vaccination of all children over four months

of age has been provided for by the statute, and school teachers may require a certificate of vaccination from intended pupils. The Provincial Government has the entire control of vital statistics (1896), the compiling being done directly by the secretary-treasurer of each municipality. Finally, the Food Act, very explicit in regard to cities, renders more definite the Federal laws on food adulterations and specifies their bearing.

In the Province of Quebec vaccination is obligatory by statute in four cities, but any other municipality may render it compulsory. The keeping of the registers of the civil state is still, as in the days of Louis XIV, confided to the care of the clergy of whatsoever denomination, and it is from those gentlemen that, each month, the Provincial Board of Health receives the certificates establishing the causes of death and those reporting the marriages and births. From these reports the Board compiles its statistics. Regarding the adulteration of foods, the Provincial Board has power to make regulations to supplement, in a certain measure, the Federal laws. In relation to the prevention of contagious diseases, hygiene in factories, sanitation in general, and the suppression of nuisances, the Quebec Provincial Board has issued permanent and very precise regulations, and has formulated in them a standard of effectiveness that must be attained by the municipal boards. Apart from these permanent regulations it has besides the eventual powers of making special regulations during the prevalence of epidemics. It can, moreover, compel the local municipal boards to enforce the powers with which the Municipal Code invests them concerning sanitary matters. Although the Provincial Board centralizes all the sanitary authority in the Province of Quebec, it does not restrain to its regulations municipalities which desire to improve on them. In both Ontario and Quebec the Provincial Boards may exercise the powers conferred upon the local boards, if such local Boards neglect or refuse to perform their duties.

In Ontario the interpretation and the enforcing of the Factory Act is left entirely to the inspectors.

In Quebec the Provincial Board expounds the law in lucid details ; not only does it specify the hygienic measures to be obtained, but it clearly explains how they should be put into practice ; consequently, all that is left for the local sanitary authorities to do is to perform them as directed by the Provincial Board.

The approval of plans of aqueducts and drainage devolves on the Provincial Board in the Provinces of Quebec and Ontario. In Quebec the law regulates the disposal of the dead, and enacts that the sites of cemeteries shall be chosen by the Provincial Board.

To keep within the time limit I must necessarily be brief in speaking of the other provinces.

New Brunswick (1887) and Nova Scotia (1893) possesses somewhat identical organizations ; thus, the Lieut.-Governor-in-council having the right to legislate on sanitary matters. The municipal boards in both these provinces enjoy similar powers ; only, in Nova Scotia the Lieut.-Governor can put his veto. The sanitary laws of New Brunswick (1887-88-89) very much resembled those of the Province of Quebec, as they confer on the Provincial Board the power to make regulations respecting the prevention of the contagion, the inspection of food and of insalubrious industries, drainage and the repression of nuisances. The Registration Law (1887) provides for the publication of vital statistics. In Nova Scotia the authority of the Provincial Board with regard to contagious disease is simply advisory ; it may, however, during an epidemic, substitute itself to inefficient municipal boards.

Manitoba (1893) admits of a special organization which seems to suit the needs of a country whose population is disseminated over a vast extent of territory. Its Provincial Board is composed of five members—a veterinary surgeon and four physicians. For the needs of local administration the four physicians are titled inspectors, and the Province is divided into four districts. In each of those districts the authority of the inspector is supreme ; he may, if he believes it necessary, set aside all orders and by-laws enacted by local authorities.

British Columbia has (1895) a Provincial Board which according to the statute seems to be only advisory, but which, nevertheless, has established very complete and very effective regulations. We will even point out a measure that surpasses those of any other provinces : it is the prohibition of discharging sewerage into any river.

Prince Edward Island has no provincial board. It has a good law respecting vaccination and, by its Health Act, local boards are appointed in two cities, and the Lieut.-Governor-in-council is empowered to appoint a Board of Health in each county.

In the North-West Territories a law relating to hygiene was passed in 1882. Its means are only preventive. The Lieut.-Governor can hinder any person within the Territories from leaving a locality in which there exists a contagious disease. He can also delay at the frontiers any suspicious outsider. He can divide up the Territories into sanitary districts, and appoint medical health officers if he judge such measures expedient.

As you may nevertheless see, gentlemen, by this short and altogether inadequate synopsis of our sanitary legislation, Canada, with regard

to hygienic matters, is striding rapidly in the path of progress. If we recall the fact that it is only since 1880 that the different Provinces of the Dominion have really appropriated the powers that the constitution gives them by allowing the formation of Provincial Boards having the necessary authority to protect public health, we have the right to hope that in the near future Canada will not be inferior in sanitation to other countries.

Gentlemen, I cordially thank you for your close and delicate attention, and, before retiring, renew our wishes of welcome to Montreal and Canada.

THE SECTION OF OBSTETRICS AND GYNÆCOLOGY.

W. Japp Sinclair, M.D.

Professor of Obstetrics and Gynæcology in Owens College, Manchester.

When I received the flattering invitation of the Council of the British Medical Association to occupy this position to-day, which is to me one of distinguished and, I fear, unmerited honour, I began to debate with myself whether I ought to take advantage of the privilege granted to me to open the proceedings of this Section with an address. The occasion seemed at first too great ; no subject within my range of ideas appeared adequate. It did not seem fitting that I should take advantage of a meeting of such unique interest—a British Empire Meeting during the Queen's Commemoration Year, in this already historic centre of commercial and intellectual achievement in the greatest of the British Colonies, to give utterance to a formal discourse of mere academic interest, chosen without spontaneity, and labouriously compiled in the library. After much cogitation, however, the feeling grew upon me that there had been in my mind more or less continuously in recent years a subject sufficiently interesting to myself and sufficiently general for the occasion. The subject is so important in its far reaching, practical bearings, in obstetrics and gynæcology, that I became convinced you would hold me justified in pressing it upon your attention, and would find in the interest of the subject matter some measure of excuse for the inevitable shortcomings in my method of handling it. The subject to which I refer is that of the *Injuries of Parturition, the Old and the New ;* and I may state at once at the outset, that the reason why it has haunted my mind is the frequency with which, as a gynæcologist, I am called upon to deal with injuries produced by parturition, and the growing conviction that in many, if not in the majority of these injuries, their existence has not appeared to be altogether satisfactorily explained as inevitable, and not a few have been proved by irrefragable evidence to be produced by operative preceedings altogether unwarranted by the circumstances.

A Comparison and a Contrast.—My position will be made more clear by one or two examples, and these lead me *in medias res.* Some time last year I was asked to see a young primipara who was very ill towards the end of the first week of the puerperium. When we met in consultation I was informed by the practitioner in charge that the case had been quite straightforward, from first to last, and in

answer to my enquiries he could not in any way account for the patient's condition, which was as serious as it could be even in a case of the kind. It appeared, in fact, almost or altogether hopeless. On making a physical examination without moving the patient from the dorsal position, I discovered a deep and wide laceration of the vaginal vault, the examining finger passing easily into the tissues of the parametrium. No mention of forceps was made in the conversation we had before seeing the patient, and it was only after the examination and in reply to a question, that my colleague explained why and when they had been applied. It seemed to me at the time that he thought the completion of labour by means of the forceps such an insignificant detail that he forgot to mention it. The child, in this case, was saved, but the mother died.

A few years ago I felt called upon to make several repairing operations on the injured pudenda of a young married woman who came under my care as a hospital patient. She had been by all accounts perfectly sound and active a year before, but meanwhile she had got married and she had become a mother. When I first examined her the uterus was found to be completely prolapsed, and it was so lacerated that the anterior and posterior halves of the cervix projecting from between the nates, looked like two separate organs, and the perineum was torn completely through into the anus. This patient then suffered from dislocation of the uterus, transverse laceration of the cervix, and complete rupture of the perineum. She was treated by Emmet's operation, restoration of the perineum, and shortening of the round ligaments, and then she was fairly comfortable with a pessary. I learned afterwards that this case had been one of normal labour in a primipara, and that the delivery had been effected instrumentally by a *locum tenens* within six hours from the commencement of the pains.

Let us now compare this sort of practice, still possible at the present day, in spite of all our anæsthetics, antiseptics, and perfected scientific apparatus with what occurred in a former and different age.

Mauriceau[1], for example, mentions a case "*Du laborieux accouchement d'une femme dont l'enfant étoit resté au passoge, à cause de l'extrême grosseur de la teste.*" He was called in March, 1669, to a primipara, aged 35, who had been in labour eight days. The head was in the cavity of the pelvis, and the child had been dead four days. The patient had been visited and abandoned by three or four surgeons, one of whom had made an incision into the soft parts of the vulva. The obstruction arose from the large size of the child's head.

[1] Observations sur la grossesse et l'accouchement etc. Paris, 1715.

Mauriceau perforated and extracted with the crotchet, and the woman who appeared to be moribund when the accoucheur arrived, lived on for eleven days, ultimately dying of "*une grosse fiévre qu'elle avoit cinq ou six jours auparavant.*" From this circumstance Mauriceau concluded that the patient might have escaped if she had been delivered two or three days earlier, that is to say, if she had been in labour only five or six days.

He relates another case "*De l'accouchement d'une femme qui eut un très-laborieux travail.*" It was that of a primipara, aged 28, who had been in labour two entire days after the rupture of the membranes. There had been ten hours of very strong pains. The head was low down in the vagina and had rested there for twelve hours. The pains had now ceased. "*Quoique sa Sagefemme luy eut donné deux clysteres assez forts, pour tâcher de luy exciter de nouvelles douleurs, et qu'elle l'eût fait aussi saigner du bras suivant mon conseil.*" . . . Mauriceau ordered a strong dose of senna to be administered, and two hours afterwards a powerful clyster. Pains then came on, and the patient was delivered without more ado, "*d'un gros enfant mâle, qui etoit encore vivant.*"

Here then, we have two extremes of practice contrasted, the helplessness of the seventeenth century, and our own resourcefulness at the end of the nineteenth, and yet it may be alleged, not without reason, that there is to be seen in the contrast only one more illustration of how "knowledge comes but wisdom lingers." Such results of our modern practice as I have given in illustration do not make it so perfectly obvious that in obstetrics we are much wiser than our sires.

The work of Mauriceau from which I have quoted, contains the famous case in which he met Chamberlen, who failed to deliver with his forceps a woman with a deformed pelvis, and immediately after fled from Paris.

Mauriceau's practice illustrates then, that of the age immediately preceding the introduction of the obstetric forceps. We may divide the century and a half from the introduction of the forceps to the present time, roughly speaking into three periods: First, from the introduction of the forceps to the discovery of anæsthetics, about a century; second, from the discovery of anæsthetics to the introduction of antiseptics, a quarter of a century; third, from the general introduction of antiseptics in midwifery practice to the present time, very nearly a quarter of a century.

Now, if we consider our present position, we have much to congratulate ourselves upon, and yet we may fairly ask if there is not much room for improvement in the use which we make of our resources.

Is not one of the most remarkable things in the history of medical science, during the last quarter of a century, the extraordinary development of gynæcology in its surgical aspect? Gynæcology flourished and has become largely surgical; so largely surgical that Sir W. J. Priestley, my predecessor of two years ago, in the position which I occupy to-day, addressed to the Obstetrical Section a warning and a remonstrance on the too free application of surgical methods to gynæcology. Midwifery has, during the same period, become also largely surgical—too surgical—and a thesis which I shall endeavour to maintain to-day is that gynæcology has become so largely surgical as the direct result of surgical interference in midwifery practice; the accoucheurs are the providers of material for the gynæcologists. I fully appreciate the admirable work done during that time by gynæcological surgeons in dealing with the new growths of the sexual organs, and I do not decry it, but for the material of his ordinary daily labour the gynæcologist has to look to the accoucheur. Last year Dr. Cullingworth did a good service to the medical profession by addressing the Obstetrical Society of London, on the subject of the undiminished childbed mortality in England in spite of our advantages and improved methods of practice. But in addition to the avoidable childbed mortality, there is the very serious question of childbed morbidity, which I maintain and repeat is largely owing to the prevalence of surgical methods in the practice of midwifery. The term "surgical" is employed here with almost exclusive reference to the use of midwifery forceps. It was said by Baudelocque that the midwifery forceps was the most useful surgical instrument ever invented, and with that strong and unqualified opinion we are all more or less in agreement. But like all our powerful remedies, the forceps must be used with circumspection, else disastrous consequences must ensue.

Now the avoidable evils which I maintain are so prevalent at the present time have developed insidiously and largely in consequence of the resources which have come to us in the evolution of medical science. If we sin, it is against the clearest light. If we trace the history of Obstetrics during the last century and a half, and consult the old and many of the new masters on the subject we find their opinions are almost unanimous on the limitations and conditions under which the practitioner should resort to his most powerful remedy. There have been from the beginning fluctuations and fashions in practice, but none in theory.

First period.—In addressing a meeting of English speaking obstetricians one cannot illustrate the theory and practice of the first

period to which I refer without quoting Smellie.[1] In Smellie's time, the men who practised obstetrics were no longer helpless in dealing with the most frequently occurring cases of difficulty, namely, in tedious labour from inertia, or from disproportion between the fœtal head and the maternal passages. In reading Smellie's collection "of laborious cases when the head of the child is low in the pelvis and delivered with forceps," no one could fail to be impressed with the caution exercised in the use of the forceps in obviously suitable cases. Take, for example, the first case, in which he makes his visit, gives his instructions for the night, and then proceeds: "When I called in the morning, I found the child's head advanced lower in the pelvis." He gives in detail his reasons for expecting further progress. He says, "Being called in the evening, and understanding that the pains were still weak and the gossips uneasy, I examined in time of a pain, and found the head was lower." He then describes in minute detail how he applied the forceps and extracted the first child in a twin pregnancy, and concludes: "I used the forceps in this case as a pair of artificial hands to assist the delivery, because the pains were too weak to expel the child." This case very well illustrates Smellie's practice, particularly the patient waiting for the natural efforts of delivery before interference. In another case he says, "The patient, though much recruited, being still weak and the pains languid, I directed the midwife to proceed in supporting her with the broth, and prescribed a cordial mixture without any opiate, to amuse the woman and her friends." In another case he was called to a patient who had been in labour for three days under the care of a midwife. "As soon as I was disengaged," he says, "I accompanied my pupil to the place where I found this loquacious midwife extremely ignorant, without the least tincture of knowledge in her possession. When called to the patient, whose pains were just beginning in this her first labour, she had walked her about and fatigued her so much that she was quite exhausted and the pains had entirely ceased. The midwife complained that her fingers were swelled and painful with stretching the birth, but she did not know how long the waters had been discharged." Smellie gave directions with the object of obtaining some rest for the patient, and early the next morning delivered her with the forceps, "without lacerating her parts or even marking the child's head."

By way of illustration of the theory of the next generation in this period, I may quote from the "Practical Essays on the Management of Pregnancy and Labour," by Dr. John Clarke, published in London in 1793. "Violence offered by the improper use of instruments may

[1] Collection of Cases and Observations in Midwifery. 3 vols. London, 1764.

also become a cause of fever; therefore they ought never to be employed in any case except where they are absolutely and indispensably necessary. He who uses them unnecessarily, and solely with the intention of saving his own time, has much to answer for, both to society and to his conscience."

If instead of accepting an opinion, we prefer to turn to a record of facts in order to draw our own conclusions, let us look into the "Practical Treatise on Midwifery," by Dr. Robert Collins, published in 1835. The author gives an account of 16,414 cases of labour in the Dublin Lying-in Hospital during his Mastership. The rules laid down by Collins for the use of the forceps sound very much like some contained in the most recent German literature on the same subject. He says, "In tedious labours, where the mouth of the womb is fully dilated, the soft parts relaxed, and the head so low in the pelvis as to bring the ear within reach of the finger, if there be a necessity for interference, the forceps may be used with advantage; but ample experience has most fully proved to me, that under these circumstances, uterine action fails but seldom in expelling the child, and that it is only in cases as above described, where the *safety* of the patient *requires assistance*, that we are justified in using this instrument."

In 16,414 deliveries in the Hospital, he met with but fourteen cases answering this description; in eleven of which the forceps were used, and in three, the lever. In the other instances where the forceps was applied the labours were complex.

There are several other situations in which the forceps may be applied with much benefit, as in convulsions, hæmorrhages, etc., where the case is, in other respects suited to their application; these are pointed out in the remarks on the treatment of such labours.

"The forceps was used during my mastership, 24 times, and the lever 3 times, total 27; making the average about 1 in 608 deliveries. According to this calculation, most physicians in private practice would require to use them but seldom as, supposing an individual to attend 4000 cases in the course of his life, which is a greater number than falls to the lot of most men, the forceps or lever would be necessary in little more than *six* cases. I consider the forceps, when used with prudence, a most valuable instrument; but its utility is greatly lessened by the injury so frequently inflicted on the patient, by having recourse to it, where *no* instrument is *necessary;* but *much more so* by using it where, in my mind, it is not only inapplicable, but highly dangerous to the patient's safety."

But it may be objected to the frank acceptance of Collins's rules for

our guidance at the present time, that the childbed mortality under such rules must have been very high. It was far otherwise. After giving an account of the measures adopted to banish or guard against puerperal fever he says, "of 10,785 patients delivered in the Hospital subsequent to this period, only 58 died, which is nearly in the proportion of 1 in every 186; "the lowest mortality, perhaps, on record in an equal number of a similar class of females." Another objection which naturally arises to what some might call procrastination in the management of labour, is the high death rate among the children born under such circumstances; but Collins supplies us with full and exact information on this subject, and the infant mortality is surprisingly small. He says, "The total number of children born was 16,654, of these 284 died previous to the mother leaving the hospital. This is nearly in the proportion of 1 in 58½, which must be considered a moderate mortality under any circumstances; however, when it is considered, that this included not only all the deaths that occurred in children born prematurely, and in twins, but also every instance where the heart even acted, or where respiration ceased in a few seconds after birth, the proportion of deaths becomes *trifling* indeed. Of the 284 deaths, 100 were premature deliveries."

The Influence of the Introduction of Anæsthetics.—The introduction of anæsthetics into midwifery practice marks the opening of such an era that every modification of the obstetric art within the first period sinks into insignificance. Time permits me only to indicate, not to fully detail, the modifications of practice during that time. We find, for example, that Smellie was rather attracted by the use of the forceps, and then he and his pupils initiated a mode of practice which came dangerously near to abuse. The work of William Hunter, who published his "Anatomy of the Gravid Uterus" in 1774, and founded physiological midwifery, produced some modification in the opposite direction, and the opinion brought about through his influence may be indicated by a quotation from his disciple Denman. "It has long been established, in this country, that the use of instruments of any kind, ought not to be allowed in the practice of midwifery, from any motives of *eligibility*. . . . Whoever will give himself time to consider the possible mistakes and want of skill in younger practitioners, which I fear many of us recollect; the instances of presumption in those, who, by experience, have acquired dexterity, and the accidents, which under certain circumstances, seem scarcely to be avoided, will be strongly impressed with a sense of the propriety of this rule."

This is also the position taken up by Collins, from whose work I

have already quoted. There can be little doubt, however, that under these rules the interests of the mothers were not conserved. The practice was to delay too long during the second stage of labour, and this brought about those terrible injuries from sloughing, leading to the formation of fistulæ between the vagina and the bladder, and between the vagina and rectum, which produced such a frightful amount of suffering among women at the most vigorous and useful period of their lives. Collins speaks of using the midwifery forceps only once in 608 cases, but he gives concisely the facts of many cases of cruelly prolonged childbirth, of which the following are fairly typical examples :

No. 504. Was brought to hospital from the country ; reported to have been five days in labour ; it was her first child ; it was dead and the head firmly fixed in the pelvis. She was much exhausted ; pulse 110 ; tongue parched. " The head was immediately lessened," and delivery effected with the crotchet. She sank on the ninth day from admission.

No. 555. Was sixty hours in labour of her first child. The pelvis was defective, and there had been no advance for the last twelve hours ; the child's death having been ascertained by the stethoscope some hours previous, the head was lessened and delivery thus completed.

No. 608. The labour pains were very tardy and feeble, producing irritation without causing any dilatation of the mouth of the womb. In this state she remained for thirty hours, after which opiates were given three times at considerable intervals, each time with benefit. and at the expiration of fifty-three hours she was delivered naturally of a still-born child.

We need not go abroad to seek the advice of the masters of the obstetric art during this period, and I need not further multiply quotations. We shall find the great teachers always sound and clear in their utterances. I shall only refer to our own Ramsbotham who comes in with Sir James Y. Simpson at the end of the first period. His great work[1] made its appearance in 1841. He considers the application of the forceps such an important operation, that be strongly recommends consultation " even though a neighbouring, probably a rival, and perhaps not very friendly practitioner," may have to be called in. And he frequently exclaims : " Cautiously and tenderly must this iron instrument be used ! . . . We must remember that one injudicious thrust, one forcible attempt at introduction, one violent effort in extraction, may bruise, may lacerate, may destroy !"

[1] Principles and Practice of Obstetric Medicine and Surgery.

The typical injury of parturition during this period was vesiço-vaginal fistula, but there can be no doubt that the not infrequent use of perforating instruments and the crotchet produced bruises and lacerations which, in pre-antiseptic days must have conduced considerably to the maternal mortality. The mistaken practice, also, of "stretching the birth" which I am afraid is by no means a thing of the past, was so prevalent that it must have done infinite injury. By causing minute necroses or lowering the vitality of the tissues it must have opened up the way to bacterial invasion with all its consequences.

Laceration of the perineum must have been occasionally inevitable in former generations as in our time. But special attention appears to have been given to its prevention. Denman indeed refers to its prevention as "the principal object of our attention in natural labours."

With the *second period* commencing with the discovery of anæsthetics, and ending with the general introduction of antiseptics, I have at present comparatively little concern. The obstetrician of that quarter of the century, of whom we may take as a type the late Dr, Mathews Duncan, was much concerned with the mechanism of labour, and this is the only period, if any exists, in the history of obstetrics when the warnings against meddlesome midwifery by the teachers ceased to be as clear and emphatic as they had been in former times. With the beginning of this period, we have the work of Marion Sims marking an epoch in the history of gynæcology. He and his contemporary imitators and his successors were long busy repairing the characteristic ancient injury of vesico-vaginal fistula, for they had the accummulated misery of a whole generation of women to cure or ameliorate. With the end of the period comes the introduction of Emmet's operation, which, according to Jenks, marks "one of the greatest advances in modern gynæcology," an opinion not even yet so generally held in England as it ought to be.

The introduction of anæsthesia did not lead to any great improvement in the practice of obstetrics, the medical practitioner could now relieve the patient from the worst pangs of parturition, and therefore could well afford to wait in normal labour for completion by the natural process. But it was soon found that the production of anæsthesia was not all gain. It was found that the prolonged administration of chloroform brought on inerta of the uterus, tedious labour, and post-partum hæmorrhage. The tediousness of the labour made the "gossips uneasy," and the most conservative of practitioners was too often driven by the appeals and reproaches of the patient and her friends to the application of the forceps. In fact, the conscious-

ness, that the final pangs of labour and the acute suffering which would otherwise be produced by the application of the forceps, could be entirely relieved by the administration of an anæsthetic, had for its practical effect a great extension of operative midwifery. Lacerations of the perineum became much more frequent than under the old practice of delay, and as it was quite unusual to suture these lacerations as is now the universal practice, incontinence of urine owing to vaginal sloughing, was replaced by incontinence of fæces resulting from complete laceration of the perineum. The lacerations of the cervix and vagina and their relation to parametritis were either unobserved or not understood until Emmet taught the medical world their importance. Just as the practice of the first period made material for the special beneficent work of Marion Sims, so the abuses of the second period provided the opportunities which Emmet had the genius to recognize and to use. He was the first to observe and describe the injury that had been inflicted, and to teach the gynæcologist the method by which it could be repaired.

Anæsthetics plus Antiseptics—The advent of the *third period*, that of anæsthetics combined with antiseptics, dates from 1870 to 1873, or somewhat later. About that time began those triumphs of abdominal and pelvic surgery applied to the diseases of women, of which men of our special branches of medicine are so justly proud. The operations in general surgery also took on a new phase, and our students, accustomed to witness in the hospital the audacity with which the modern surgeon, depending upon anæsthetics and antiseptics, could deal with new growths and surgical injuries, were influenced, perhaps almost unconsciously, by what they had seen of operative surgery, towards applying its methods to midwifery practice. There has been little of precept and example to counteract this tendency. Our students in the medical schools are not taught obstetrics and gynæcology in a reasonably practical way, while on the other hand they apply themselves to surgery, theory and practice, from the time they pass the entrance examination until they graduate. They learn surgery which they will never practice, and they will practice midwifery which they have never learned.

But the mischief is not merely negative. If the young practitioner turns to some of our English manuals of midwifery, or to contributions to our medical journals, he is liable to be misled into practice which is actively harmful. It would be a long and invidious task to support this statement by references, but it may be as well to take one or two illustrations. A friend of mine has published a "Practice of Midwifery" as a guide for practitioners and students. The edition

from which I quote is dated 1896. He says, "The perverted old adage that 'meddlesome midwifery is bad' has long stood in the way of an early application of the forceps in uterine inertia . . . . . Rash and inconsiderate measures I would not be thought to encourage . . . . but we must not let our caution warp our judgment and so delay a comparatively simple and harmless operation until it becomes one that is difficult and dangerous." On the rest of his chapter on the forceps I have no relevant criticism to make, except that it is too much like the summing up of a judge to a jury, to afford a clear, definite and helpful guidance to the student; but in this respect it is by no means an exception among the manuals.

I have already quoted a master of the Rotunda Hospital of Dublin, and I should like to refer for a moment to a phase of midwifery practice initiated, or largely influenced in its development, by another. Dr. Johnston[1] published an account of the use of the forceps at the Rotunda Hospital in Dublin during the year 1875. He says, "There were 113 cases where we considered it advisable to deliver with the forceps, and 83 of these were primiparæ, ... 75 mothers recovered, 8 died, 6 being cases of seduction, fretting; 2 cases of peritonitis. Thirty were pluriparæ: 26 mothers recovered, 2 died." There were 1,025 cases, and the forceps were used in 11 per cent. The maternal mortality is 10 per cent. in the forceps cases. Death in child-bed from "fretting" appears to be a specialty of the Dublin medical school. They have not anything of the kind in Germany, and Fritsch, in his book on puerperal fever, in referring to the Dublin peculiarity, calls it "dummheit." Dr. Johnston goes on to meet the objection that the forceps is a dangerous instrument, and he says, "As a proof to the contrary I may mention that of the 752 cases that have been delivered within the last seven years, in no one instance was injury inflicted by the instruments on the soft parts of the mother." We shall see again how the best practice in the German lying-in hospitals contrasts with this wonderful result. There they have not three times as many deaths from fretting as from peritonitis, but they confess to inflicting much injury on the soft parts by the use of the forceps. After the usual formal caution against rash interference, Dr. Johnston goes on to say, "The more we see of early interference and the benefits arising from it, the more we are induced to persevere in it." He says little about his mortality, which was about double that of ovariotomy in experienced hands. His argument that this operation should not be undertaken by an "unskilful person," introducing a comparison between applying the forceps and tying the

[1] "Medical Press and Circular," January, 1876.

subclavian artery or lithotomy, amounts to a plea for leaving operative midwifery entirely in the hands of a special class.

Facilis descensus averni. We soon find even such an experienced and cautious obstetrician as Dr. Swayne,[1] of Bristol, referring to Dr. Johnston's hospital reports, and expressing approval of the practice of using the forceps during the first stage of labour. Dr. Swayne quotes Denman's aphorism, "The first stage of labour must be perfectly finished before we think of applying forceps," and he declares with evident satisfaction that in no branch of obstetrics have we departed from the precepts and practice of our forefathers as in this.

Further examples might be quoted by the score. The deterioration went on rapidly, until many teachers and writers of manuals seemed to have hardly the courage to speak with clearness and precision, and they talked and wrote as if they had no decided opinion of their own. Their formal cautions and restrictions, more or less explicitly stated to be applicable to the practice of the experienced and skilful, are a mere sham as applied to the untaught young practitioner, and they become a delusion and a snare.

It is only about twenty years since Dr. Swayne referred to the use of forceps in the first stage of labour as a "startling innovation" in obstetric practice; and the midwifery practice of to-day, especially among the working classes in England, is something to wonder at and deplore. The young practitioner sees a woman suffering under the pangs of labour; he can relieve these by anæsthetics; normal labour is a process which requires time; the practitioner does not like waiting, and he has appliances by which he can abridge the process of normal labour; he knows he may produce injuries, but these are in his eyes trifling compared with the injuries he has been accustomed to see treated successfully by the surgeon with the aid of antiseptic appliances, and a laceration can always be sutured if it appears to be of sufficient importance. Why, therefore, should he permit suffering to his patient, and waste his own time? He does not know enough of gynæcological practice to be impressed with the importance of a laceration of the cervix or vagina, or a dislocation of the uterus; that is to say, of the remoter consequences of his well-meant interference. More than that, although he may have attended the statutory number of labours required by his college or university, he has enjoyed few advantages of direct practical instruction and example; he may be unable to diagnose the presentation, so he must trust to force alone; he has seen little or nothing of the puerperal state, so he is hardly in

[1] "British Medical Journal," April, 1877.

a position to appreciate the risk to his patient or to recognise some of even the immediate effects of operative midwifery.

Meddlesome Midwifery.—I have endeavoured to trace the course of change in obstetric practice in England, and to indicate the causes. That practice is now, in my estimation, vastly too meddlesome and mischievous and some reform is urgently required. Probably few men even in the medical profession who do not actually see midwifery practice among the working classes of our large towns, or have their attention constantly drawn to the injuries resulting from their practice, are aware of the actual state of affairs. In Manchester, and the manufacturing towns of Lancashire, the proportion of cases in which the forceps are applied, with or without indications, amounts to five and twenty or thirty per cent. and even more. One of my friends who has a large general practice within the area covered by our Maternity Hospital has been good enough to give me a statement of his midwifery practice for the last ten years, and the proportion comes as nearly as possible to twenty-five per cent. From 1885 to 1889, five years, he attended 839 cases, and applied the forceps in 142, that is, in 17 per cent. From 1890 to 1896, seven years, he attended 900 cases and used the forceps in 246, that is a percentage of 27.3. His rate of forceps delivery is highest in 1896, when he used the instrument 50 times in 150 cases. Another friend, whose practice mostly lies within the same area, tells me that his proportion is at least thirty per cent. The highest figure mentioned to me has been 75 per cent. A busy practitioner whose field of operations lies in one of the largest manufacturing towns in Lancashire, told me, in answer to the question which I so frequently put, "What is the percentage of forceps cases in your practice?" that his was "At least seventy-five per cent." "But," I replied, "you must be joking." "Not at all," he said, "between high and low applications of the forceps, at least seventy-five per cent. "But," I said, "surely you have no appreciable number of cases of application of the forceps at the brim?" "I had three cases only last week, but it is a good while since I had such a case before," and to prove to me that his seventy-five percentage was a fact and within the mark, he promised to give me the exact figures from the record of his cases.

I have been frequently told by practitioners in similar communities, that in the case of a multipara, they allow half an hour to an hour for the second stage of labour, and if the case does not show signs of immediate spontaneous completion, they apply the forceps. Among the gynæcological cases at the Manchester Southern Hospital it is by no means a rare thing to find a young woman suffering from disloca-

tion of the uterus and lacerations of the cervix and of the perineum, whose first labour was terminated by forceps within four to six hours of the onset of regular pains.

Now, before passing judgment on this kind of practice as to whether it is reasonable, or unavoidable, or praisworthy, or the reverse of all that, we must find a criterion of good practice. What means have we of forming an opinion as to the proportion of cases in which we may have to interfere *under proper indications;* that is to say, when symptoms indicate some danger to the mother, to the child, or to both. We must obviously compare the methods of treatment adopted and the results obtained over large numbers of recorded cases. For my present purpose I naturally put before you in the first place facts with which I am conversant and can establish beyond dispute. I have here figures showing the details of two years of the practice of the Manchester Maternity Hospital. The hospital contains only twelve beds for in-patients. The home-patients who form the great majority, are attended by more or less trained and experienced midwives. The midwives have instructions in case of difficulty to send for the assistance of a district obstetric physician, who lives within the area for which she is responsible.

MANCHESTER MATERNITY HOSPITAL.

From October 1st, 1894, to September 30th, 1895.

In Patients—

Total number confined in hospital	183
" " delivered with forceps	12

Out Patients—

Total number attended	1102
District obstetric physicians sent for by midwives, forceps cases.	15

Doctor called in by midwife on account of—

Adherent, or retained placenta	4 cases.
Breech presentation	1 "
Transverse presentation	1 "
Placenta prævia	1 "

From October 1st 1895, to September 30th. 1896.

In Patients—

Total number confined in hospital	177
" " delivered with forceps	21

Out Patients—

Total number attended to	947
" " forceps cases	14

In the home-patient department, in addition to the fourteen forceps cases, the doctor was called in three times to twin cases (second twin transverse). Abortion 1. Retained placenta 2. Post-partum hæmorrhage 1, and shoulder presentation 1. Placenta prævia 1.

Only simple forceps cases are set down in this statement: the few in which forceps were applied after version are not included.

It will be seen from these figures that the forceps deliveries among in-patients are in a comparatively high proportion, but it must be explained that the hospital beds are understood to be retained for

cases of difficulty and danger; hence a large proportion of the women admitted have a history of difficult or operative labour in the past. The proportion of forceps deliveries among these in-patients is almost exactly nine per cent. and no woman died after the use of the forceps. The proportion of forceps deliveries among the home-patients in the charge of the midwives may be considered the normal requirements in such a community as ours. The midwives are under strict supervision Their credit is at stake if they lose their heads and send too frequently for medical assistance, and their position is in danger if harm comes to the mother or child by want of knowledge and judgment in failing to send when necessity arises. Now, in 2049 home-patient deliveries, the forceps had to be applied by the obstetric physicians 29 times; that is as nearly as possible, 1·4 per cent. I have already called your attention to the fact that within the same area of population, but among the class of people who can afford to pay for private medical attendance, the proportion of forceps deliveries is from five and twenty to thirty per cent. Such a striking contrast surely supplies food for reflection and calls for explanation. Another point, which I mention with some diffidence because I have only my own figures to offer by way of illustration, is the remarkable difference in the proportion of forceps deliveries among the poor as compared with those in a better position in life. I have for a long time made cautious inquiries with regard to the history of the confinements in taking notes of my private gynæcological cases, and my conclusion is that the hospital patients are delivered with forceps more than ten times as often as the class of women who consult the gynæcologist privately and may therefore be assumed to be in a position to pay higher fees to the accoucheur. If this result should be found on extended enquiry, to coincide with the experiences of others in a similar position, it is a not unimportant fact in guiding our judgment to a conclusion as to how far we may have drifted astray from right and reasonable midwifery practice at the present time, and as to one cause at least of the aberration.

My attention was first attracted to this subject about twelve years ago, and I have given it some attention ever since. I was then assisting an experienced accoucheur in a case of normal labour in a primipara. As far as I could judge, nothing could be more typically normal than the labour up to the point of what appeared the approaching completion of the second stage, and yet I was asked to assist in an obstetric operation by administering an anæsthetic, although my senior had made previously some joke about the "healthy young animal" type of the pains, and they as far as I could see had not

changed from that type. He applied the forceps, and by repeated efforts at traction effected delivery, lacerating the vagina and perineum. The immediate results were those we are familiar with including an attack of parametritis, the remoter effects were prominent cicatrix of the vagina, and chronic bad health. I am reminded of the history from time to time by being consulted by the patient.

My enquiries into the need for such operations and their consequences have gone on intermittently ever since, and I have noted with great satisfaction the rising protest in Germany against the abuse of the forceps.

There is now a considerable literature on the subject of forceps deliveries. There is not time, nor is this quite the occasion for going into many details on the subject. I may, however, make some concise reference to certain facts recorded in this literature, as I consider it of the greatest possible value to those who may wish to form an independent judgment on the matter, on account of the large amount of material and the exactness with which the whole matter is put before the reader. In 1889 Münchmeyer[1] published a valuable article in which he gave an account of the cases of labour completed with forceps in the Royal Hospital for Women in Dresden, from 1883 to 1888, and the last of this series of papers which I have seen is that by Dr. Béla von Walla which he calls "Studien im Auschlurs an 115 Zangen operationen." It appears in the fifth volume of the *Monatsschrift für Geburtshülfe und Gynæcologie*. It is an account of the cases delivered with forceps in the University Klinik for Obstetrics and Gynæcology at Buda-Pest. From the 1st September, 1882, to December 31st, 1895, there were 11,064 women confined in this hospital. Of these labours 115 were completed with forceps, that is, in the proportion of 1·04 per cent. over the whole time, and in 1895 the percentage of forceps operations sank to 0·32. It is instructive to compare with this the frequency with which forceps operations are performed in other German university kliniks, and also to compare the most extreme cases with our own general practice. Wahl, in his paper continuing the report of the Dresden Hospital begun by Münchmeyer, gives an interesting table showing the relative frequency with which the forceps have been used at various maternity hospitals:

Kézmarszky, Buda-Pest, 1874-1882	1·4 per cent.
Abegg, Danzig, 1872-1885	2·2 "
von Winckel, München, 1884-1890	2·6 "
Leopold, Dresden, 1889-1894	2·56 "
Gusserow, Berlin (Charité), 1882-1886	2·66 "
Leopold, Dresden, 1883-1888	2·8 "

[1] "Archiv für Gynäkologie," Vol. 36.

von Winckle, Dresden, 1879-1883	3·	per cent.
Ahlfeld, Marburg, 1881-1888	3·5	"
von Rosthorn, Prag, 1891-1894	3·63	"
Stuttgarter Geb, Austalt, 1872-1885	3·7	"
Braun, Wien	4·3	"
Kehrer, Heidelberg	4·6	"
Olshausen, Berlin	4·96	"
Fehling, Basel, 1887-1893	5·33	"
Sutugin	6·	"
von Säxinger, Tubingen	6·5	"
Olshausen, Halle	8·4	"
Schauta, Innsbruck, 1881-1887	9·16	"
Schultze, Jena	11·6	"

As Wahl points out in the contribution from which I am now quoting, the great difference in these figures indicates a marked difference of opinion as to what are the indications for the use of the forceps. In Budapest and in Dresden, the indications for the forceps are very strictly and narrowly defined, whatever may be the rule at other institutions. At some of the medical school hospitals it is unfortunately thought right to apply the forceps in cases of normal labour in order to give instruction to the students.

This is an excellent account of the forceps treatment of labour in the Dresden Hospital which is given by Wahl.[1] It is, as already mentioned, in continuation and supplement of Münchmeyer's report six years before, and deals with the cases delivered within the hospital from 1889 to the end of 1894—six years. The whole number of cases was 9,061 ; forceps were used in 232 cases, that is, in 2.5 per cent. An examination of the details gives some extremely interesting information, which, however, is not altogether relevant to the present purpose. The forceps were used only on certain exact conditions and indications. The cervix must be completely dilated ; the membranes ruptured, and the sagital suture as nearly as possible in the antero-posterior diameter of the pelvic outlet. There were 212, or 91.5 per cent. of typical cases for the application of the forceps ; there were only 17 cases in the whole 9,000 in which the forceps were applied while the head was at the pelvic brim. The final indication for resorting to forceps was always danger to the mother, to the child, or to both, and three to four hours was the period allowed for the second stage of labour. At Buda-Pest the time allowed for the second stage was five to six hours.

Remarkably interesting, too, is the information contained in this report regarding the morbidity and the mortality of both mothers and children. The results for both are as good as any ever published. The only point, however, to which I wish specially to call attention is the number and extent of the lacerations and injuries which are attri-

[1] Uber die entbindungen mit der Zange an der Königh, 1894. Frauenklinik in Dresden in den Jahren 1889, bis 1, Januar 1896. Archiv für Gynäcologie, Bd. 50.

buted to the forceps under conditions in which observations could be exactly made. Münchmeyer reports 85 per cent. of lacerations, including in this episiotomy performed by himself to prevent worse lacerations, and those small injuries which could be repaired with a single suture. Schmidt found 84.6 per cent. of lacerations of the vagina and perineum, two of the latter complete, in 132 forceps operations at the Klinik of Basel. The latest results at Dresden, as given by Wahl, appear to be somewhat better. In 232 cases the percentage of injuries was 81.4 per cent. These included injuries to the vagina, to the cervix, and to the perineum, some of which were slight, others extremely severe. There were lacerations of the cervix which required immediate suturing to stop the hæmorrhage, and there were six complete lacerations of the perineum. *Only 18 per cent of the cases were uninjured.* Münchmeyer may well refer to the application of the forceps as the bloodiest operation in medical practice, and Wahl quote with approval the opinion of Von Winkel, that even in the hands of an experienced operator, the forceps is an instrument by no means devoid of danger. Compare these results of cautious forceps delivery with Dr. George Johnston's who had 752 forceps cases "without once injuring the soft parts" and yet he applied the forceps in the first stage.

It would be tedious and serve no good purpose to go on multiplying experiences. All that we see and all that we read seems to point to the fact that we have replaced the one great injury of parturition of former generations—vesico-vaginal fistula, by a host of others, vesico-vaginal fistula by laceration instead of by sloughing included. There is a general impression that sloughing was very common in former generations owing to long continued pressure. It is extremely difficult to get any information on the relative frequency. I have gone through the 700 cases which form the material of Mauriceau's work, and have found only six cases in which incontinence of urine resulted from tedious labour. The utero-vesico-vaginal fistulæ which we have to deal with are not extremely rare, and these are invariably produced by premature application of the midwifery forceps in primiparæ. There can be no question that many other such fistulæ are produced, but we never see them, because the patients die in childbed. In addition to the lacerations, and disablement which comes from them as lacerations, there are numerous other acute and subacute troubles, such as parametritis and cicatrisation. When we see such injuries with attendant displacements so frequently produced, when we think of the extreme differences in the practice prevailing in one country and another, or among one class of society or another,

is it not reasonable to conclude that there must be something seriously wrong with our theories or our practices, or with both ?

My present purpose is not so much to attempt to prove anything to demonstration, as to call attention to certain obvious evils, and by a plain statement of facts to establish a *prima facie* case for closer investigation of the question,

> " That from Discussion's lip may fall
> The law which working strongly binds."

I may, however, without irrelevance remark now, that I have myself a firm conviction that serious evils exist ; that a vast amount of unnecessary misery is produced, and that it should not surpass the wit of man to find a remedy. I am quite aware of the difficulties that meet the individual practitioner. I have been too long a general practitioner, before specialising, to have missed my share of those experiences, and perhaps it may raise a smile if I say, from that point of view, " that the gossips being uneasy," in the language of Smellie, is one of the real difficulties in the way of reform, if by " gossips" we mean those interested in the patient who may have some sort of right to ask questions or claim the privilege of offering well-meant but ignorant suggestions, concerning the " exhausted" condition of some vigorous young women in the first hours of a normal labour. It is only the formation of a strong professional opinion, and then a public opinion that will enable the individual practitioner to hold on to the proper course without ruinous injury to his professional position and character. But I believe that just as twenty years ago we met with men who feared to suture a spontaneously lacerated perineum, lest they should be blamed for producing the injury, and now among their successors meet with few who would not fear to be blamed if they did not suture such a lacerated perineum ; so the same process of formation of opinion by the practice of men of clear views and strong will with regard to the forceps, would bring about a similar reform.

Among the causes which give rise to the present abuses must be put in a high place our over-confidence in antiseptics. Too many of our practitioners think that they can do anything in the way of manipulation, digital or instrumental, if only they use some chemical solution with sufficient copiousness. This, I am afraid, is a fatal delusion. Such at least is the conclusion I am compelled to draw from my own experience of cases of puerperal fever seen in consultation. It is a pathetic and humiliating sight to see a healthy young women dying in childbed, with her little wedding presents as yet untarnished around her, *because* the medical attendant has thought it

right to risk the production of injuries in a first and normal labour under the mistaken impression that he can prevent bacterial invasion by means of some weak solution of permanganate of potash and mercury or other chemical which he calls an antiseptic. I believe in antiseptics certainly, but my faith does not carry me to the extreme point of the schoolboy's definition as to the faculty of believing what we know cannot be true.

But the great difficulty in the way of either prevention or reform of abuses is the want of systematic practical instruction in our Maternity Hospitals, the absence of the precept and example of the best available men at the bedside. The consequence is that our young medical practitioners at the commencement of their careers have to learn midwifery by a process which amounts to involuntary experiment upon their patients. While the German medical student learns midwifery and gynæcology as he learns surgery, and the subject ranks with medicine and surgery in the examinations, we are still content to insist as far as practical instruction in obstetrics is concerned, merely upon a formal compliance with certain regulations which do not necessarily imply practical knowledge worthy of the name.

The solution of the problem before us must sooner or later be attempted ; that problem is, " How are we to proceed in order to reconcile the avoidance of injuries to our patients which may carry important consequence to life and health in their train, with the use of the scientific resources of our generation which should enable us, under proper safeguards, to soothe and curtail the mental and physical suffering which at the best are inherent in the process of parturition ?"

You have heard what I have to say. I do not assume the position of guide or philosopher ; I take the advantage of the opportunity you offer me to call the attention of the profession to what I believe to be a crying evil. If you, the professors of the science of obstetrics and gynæcology, believe the evil exists, you will find the remedy.

THE SECTION OF PHARMACOLOGY AND THERAPEUTICS.

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Past and Present views as to the Actions of Medicines.—The Section of Pharmacology and Therapeutics over which I have the honour to preside, is one of those which is not always constituted at the Annual Meetings of the British Medical Association. The fact that one side of its work—the therapeutical—can be dealt with in other sections is doubtless the chief cause of this; a second may be a certain lack of interest in Pharmacology. Comparatively little attention has been given in England in recent years to the cultivation of knowledge concerning the method in which remedial agents act. In most countries, however, a constantly increasing interest is being shown in determining, not only the action of remedies, but the mode of their action. The establishment on this side of the Atlantic of that admirable periodical "The Journal of Experimental Medicine" in which Pharmacology takes its place with Physiology, Pathology and Medicine, is a valuable sign of this interest, and my great pleasure at being honoured with the office of President of this Section is heightened by the feeling that by its constitution on this occasion evidence is given of the appreciation of the scientific as well as the practical side of therapeutics in this country.

The basis of therapeutic practice is, or ought to be, observation, but therapeutic observations are commonly made on experiments or trials which are the outcome of opinions held as to the nature of disease and cure, and these opinions are apt to bias judgment. Even when we give long used drugs, we commonly make trial of them under new conditions; each trial is accompanied by some pre-conceived idea, and hence practical therapeutics has always been largely influenced by views as to the nature of disease and cure. Now amongst these views, none have been more potent in their effects on practice than those relating to the manner in which remedial agents act; and since recent discoveries in the area common to physiology, pathology and pharmacology have an important bearing on these views, a few remarks on present and past opinions as to the method in which medicines act, and on the influence of these opinions upon therapeutics, may, it seems to me, be a fitting introduction to the work of the Section. As

regards past views, however, I will confine myself, as befits the year in which we meet, to the period of our Queen's reign.

Sixty years ago.—Sixty years ago the main lines of the pharmacological views now prevaling had already been laid, though the chief postulate on which they rested was by no means universally granted.

One of the ablest Pharmacologists of the day—Pereira—writing in 1836, set forth general views with regard to the action of medicines which are for the most part accepted now. They act usually, he held, after absorption, and being carried by the blood to the various parts of the body, influence the tissues and therefore, the functions of the organs which, from some unknown cause, have a special attraction for them. The exact methods in which they thus influence tissues, he considered, were involved in impenetrable mystery. But the very basis of this view as to the action of medicines, their absorption from the stomach prior to the production of their effects, was not accepted by many eminent observers. The discovery of the marked influence which may be produced owing to the conduction of impressions in a direct or reflex manner had greatly impressed men, and in the absence of knowledge we now have as to the nature of disease, there were difficulties in accepting the view with regard to absorption. Travers, for example, pointed out that a punctured wound causes tetanus, as strychnia does, and he argued that as it was not likely the effects were produced in different ways, and as in the case of injury, there could be no absorption, the influence of the strychnia was not due to its absorption. Brodie and Todd Thompson held similar views. They did not indeed deny that absorption takes place sometimes, for the presence of active principles taken by the mouth in the secretions of different parts of the body had long been shown. But they held it probable that the effects of such medicines as strychnia and hydrocynic acid on the various organs were due to influences conducted by the nerves from the stomach, and not to their absorption.

Pereira pointed out that medicines may act in other ways as for example by reflex influence, by simply adding some substance to the blood which is wanting in it, or by producing chemical changes, but he thought that the chemical constitution of a substance bore no important relation to its action.

The views he enunciated with regard to the method in which medicines act gradually gained ground; but Headland, writing on the action of medicines eighteen years later, still considered it necessary to prove at considerable length that drugs when taken internally act for the most part only when they have been absorbed.

In his philosophical work he drew attention to the necessity for

distinguishing between the knowledge of the action of drugs in health and of their effects in diseased conditions; and he pointed out that the former is insufficient, inasmuch as the conditions of action are quite altered by disease; and whereas, Pereira adopted a physiological classification, arranging medicines according to the method in which they influence organs, Headland classified drugs according to the manner in which they operate in disease, trying to indicate the methods in which they influence pathological conditions so as to combat the effects of disease.

The views Headland upheld as to the necessity for knowledge as to the method in which drugs influence diseased organs and tissues have borne good fruit, though his hypotheses have not been for the most part sustained by further investigation. Let me here point out that the widening of research into the effect of drugs so as to include their influence on disease as well as health, has led in Great Britain to the introduction of a new word, or rather to the modification of an old one. The term "Physiological action" can only be applied to the action of an agent on healthy tissues and organs. It cannot include the effects produced in diseased conditions. Yet investigations are constantly made concerning these effects entirely apart from any consideration of curative influence. To express that department of knowledge which deals with the general action of drugs, apart from their therapeutic use, the word "Pharmacodynamics" existed, but it was felt to be in several ways unsatisfactory, so the word "Pharmacology," which had been hitherto used as synonymous with "Materia Medica," was borrowed as a new name for the growing department, and made to include the action of remedial agents in health and disease, and this too in a wide sense, since it deals with the causes as well as the conditions of disease.

In the early part of the period of which I speak, the Brunonian doctrine, that all medicines really act as stimulants though in a varying degree, no longer held its ground, and faith in the Rassorian view, that remedies are either stimulants or contra-stimulants, was waning fast. But, perhaps owing to the past prevalence of these and still older doctrines, we find that the word "stimulant" was used in a somewhat different sense from that in which it is now employed. It was constantly used in a vitalistic sense to indicate something which called forth the unknown vital force. Medicines were ranked as stimulants without any definite view that they increased activity of function in any particular part of the body. And many other words as "Sedatives" and "Tonics" were used in a looser manner than at present.

The examinations given of the mechanism by which drugs act were in many instances founded on mere supposition. Effects we now know to be the result of the direct action of an agent on glands or nerve endings for example were then supposed to be due to impressions conveyed directly by nerves from the place at which the drug came into contact with the tissues. On the other hand, the important part really played by the conduction to the periphery of effects produced by drugs on nerve centres was little known.

Then again, there was a widespread impression that the capillary system was the chief seat of action of most drugs. It was thought by some for example, that the effects of mercury, iodine, as well as colchicum, bark, and antimony, were due chiefly to their action in contracting the capillaries; and to certain drugs, the exact effects of which were quite unknown, was attributed a power of stimulating the capillaries generally, so as to cause increased flow of blood through them. The real power which many medicines have of dilating or contracting vessels was unsuspected.

The chemical theories of the day, especially the ingenious suggestions of Liebig for explaining the effects of certain agents, added to the diversity of views which existed as to the method in which medicines produce their curative effects, and the investigations into physiological action, though well commenced, had not advanced far enough to curb erratic theories.

The views taken as to the powers and uses of various drugs differed much. Mercury, for example, was regarded by some as acting directly as an absorbent; by some as dissolving fibrin and corpuscles, and thus combating inflammatory processes and promoting absorption, whilst it antagonised syphilitic poison if present. Other observers again regarded it as a tonic, exerting its influence by contracting the capillaries. Digitalis was regarded by many as a sedative to the nervous system, by some as acting chiefly by depressing the heart's action. This diversity of views existing in the early Victorian Period was well reflected in the diversity of practice we find prevailing.

The Progress of Pharmacology.—The laborious work of many observers quickly added much to what was known when Pereira first wrote concerning the physiological action of drugs, and their effects in pathological conditions. It became evident that a drug may depress or excite the function of one part of the brain and not another; that by acting on one we may inhibit the action of another part without acting directly on it, or remove the inhibitory action already existing. That in the heart a drug may act on the muscle

and strengthen its action, and yet check its speed by influence exerted elsewhere; that a tonic acts by definitely increasing the nutritive changes in certain parts. And so the words "stimulant," "tonic," and many others of a similar kind, acquired more precise meanings, and became associated with the idea of distinct effects on various parts of the body structures.

Then, too, the exact tissues in various organs on which drugs act was determined with constantly increasing certainty. It was shown, for example, that one drug may act on the nerve-endings in a gland, another on the gland structure itself. As a consequence, many old hypotheses, founded on incorrect suppositions, died out, and with them disappeared the practice to which they had led.

But increasing knowledge concerning the action of drugs did much more than relieve from the incubus of groundless theories and the consequences thereof. It led to new and valuable knowledge as to the therapeutic uses of drugs which simple observation had failed to discover. Strychnine, for example, had long been used in paralysis and other ailments on account of its known action on the spinal cord, discovered by Majendi. Yet for many years it was not employed in cardiac and respiratory troubles. When, however, it was shown by P. Rokitansky that it stimulates the respiratory centre, it was tried in pulmonary diseases, and it has since become one of the most largely used and important respiratory stimulants in serious lung disease.

The history of digitalis is very interesting as shown in the bearing of pharmacology on the knowledge of the real therapeutic use of drugs. Withering, by careful observation, obtained a very good knowledge of the action of digitalis. He not only pointed out the conditions in which it is of service, but even indicated the nature of its cardiac action; for he showed that it is of special use (as a diuretic) when the pulse is feeble and intermitting, but seldom of service when tension is high, or as he put it, "in those with a tight and cordy pulse." This was in 1785. Nevertheless, for more than fifty years later it was usually regarded as a cardiac depressant, and in many books on medicine recommended under entirely wrong views as to its real therapeutic effects. It was not until its true pharmacological action was discovered by experiment that its true therapeutic rôle became generally recognised and utilised. A well observed therapeutic fact is often neglected until pharmacology points out its cause and value.

Then again, the new department of pharmacology added largely to our agents for treating disease. It was the powerful physiological influence found by experiment to be exerted on animals by the many

active principles and drugs discovered in the early part of this century which led to the therapeutic trials of many, and the introduction of some, into the pharmacopœia, and Brunton's discovery of the value of amyl nitrite,which was the outcome of the examination of the nitrites by Gagee, is a well known instance of the value of pharmacological research.

But it was to an advance of knowledge beyond that which Pereira thought possible—to the recognition of a connection between the chemical constitution and physiological action—that we owe the discovery in recent years of a large number of substances having valuable therapeutic properties. The chemist and pharmacologist have worked together; it has been found possible to find out the influence of various chemical groups and to join them together in various ways, so that the products shall have, to some extent at least, the effects which might be anticipated from the influence of groups. Most valuable additions have been made to our therapeutic agents in consequence.

At one time it seemed that with increasing knowledge of the nature of disease, of the action of drugs, and of the construction of remedies, pharmacology would march straight to victory, that we had only to accumulate information relating to antiseptics and to determine more accurately the influence exercised on tissues and organs by groups and compounds, to acquire the power of combating all forms of evil. There seemed ground for hope that, as the pathologist pointed out the causes of disease and the changes produced in the organs by it, the pharmacologist might be able to devise drugs which should remove the causes or antagonise their effects.

The knowledge of the method in which drugs remove the cause of disease and counteract its results, did indeed greatly increase, so, too, did our power of lessening suffering; but something more was required. We could not combat the evils produced by disease at all essential points of attack, and our power to stay its progress was therefore very limited. And no way was made in the discovery of substances capable of generally antagonising the functional changes and pathological conditions characteristic of special forms of disease. No drugs were found acting as mercury does in syphilis, and the method of action of this and also of some of the best known of our remedies has remained undetermined.

Influence of Recent Discoveries on Pharmacology.—But in very recent times, owing to the investigations of pathologists and physiologists, light has come. The discoveries made concerning the curative influence of certain animal substances, such as thyroid gland, and con-

cerning toxines and the anti-toxines mark a new departure in therapeutics. How do they affect existing views concerning the action and uses of drugs? Strong views have recently been expressed on this point.

Dr. Saundby, for example, considers that though the recent discoveries with regard to pathogenic organisms and their products open up to us an altogether new prospect in therapeutics, the system of pharmacology is about to pass into the limbo of the forgotten, and Prof. Behring, of Marburg, thinks that in the light of serum treatment all our older views must vanish. Cellular pathology, he says, has become unfruitful for therapeutics; it is vain to treat the organs which are affected. Serum treatment, if we may judge from the resumé of his paper, which was read at the recent "Congress fur innere Medicin" at Berlin, is alone efficient. If Behring's view as to its nature is correct, its study is almost outside the boundaries of pharmacology, for he holds antitoxine is not a definite chemical compound, but a *quality*, inherent in certain albuminous substances as magnetism is in the magnetic oxide of iron. If antitoxines are powers, not substances, we are almost carried into a new world in which pharmacology, as at present understood, has no place. There seems little probability that the view of the enthusiastic supporter of serum treatment has any real foundation, and as I do not know the reasoning that has led to its adoption I shall not attempt to controvert it. The general bearing, however, of treatment by animal substances on our ideas as to the methods in which medicines act is worthy of consideration. My contention is that the new discoveries, whilst extending the domain of pharmacology, are in no way opposed to its long established teachings; that the various animal substances act on the same lines as the older remedies, though they possess certain properties which are wanting, or less apparent, in the older drugs, and that even if the most sanguine expectations of their powers are fully borne out, the utility of the pharmacological knowledge already acquired will not be lessened.

Concerning the action of thyroid and allied substances, I need say but little. Physiological and pathological investigations indicate that the ductless glands, and even those which furnish excretions, supply some material which passes into the blood, and it is just possible that other tissues do the same. These internal secretions are probably necessary for the chemical transformation of other substances in various parts of the system, and if the supply be defective, certain ailments result. By giving thyroid gland we can certainly remove the effects due to an insufficient supply of its secretions, and

reason has been given for believing that several other animal substances and their extracts yield, when given internally, material wanting in the blood, and thus prove of advantage in some diseases. But we have here no new pharmacological principle. The administration of a remedy for the purpose of adding something to the blood, which is not present in sufficient quantity, is not a departure from ordinary pharmacological ideas or therapeutic proceedings. In the case of the thyroid, the substance which contains the active material giving its power, has been separated, and we shall have an account of it from Dr. Hutchinson.

The effect of toxines and antitoxines requires to be more fully dealt with, but before comparing their action with that of other medicinal substances, let me point out opinions formed in late years with regard to the intimate action of the latter.

In the first place it has become clear that for the changes in functions or tissues we must chiefly look to the effects produced by drugs on the ultimate tissue elements, or cell protoplasm that is, and Schmiedebery long ago pointed out that this influence is probably to some extent molecular. The presence of molecules of elements or chemical compounds seems to produce some effect on those of the protoplasm which leads to change in function of the tissues into which the protoplasm enters. But this change lasts usually as long only as the molecules of the elements or compounds are in contact with the organic elements, which commonly work on in a normal manner after the excretion of the drug molecules. We can show this experimentally. If the gastrocnemius of a frog is soaked in a dilute solution of nitrate of sodium, its function of contractility is powerfully altered, yet as soon as we wash out the nitrate the normal function of the muscle is restored. What the nature of the relation is between the molecules of the drug and the molecules of the protoplasm, we do not know. Sometimes, undoubtedly, chemical changes occur. For example, the protoplasm may withdraw oxygen from the drug, and in this way its functions may be modified, and the drug itself may be altered in composition. From what we know of the action of chemical compounds on protoplasm, it is quite possible that a compound at times forms some kind of chemical union with the protoplasm, and perhaps even when there is no apparent chemical change, as in the case of the nitrite, there is one in reality. But there is also reason for thinking that the molecules of a compound may influence the protoplasm in a catalytic manner. We know, for example, that if dilute hydrochloric acid be added to an aqueous solution of methylacetate it leads to the decomposition of the acetate into

alcohol and acid without itself undergoing any alteration. It is quite possible that pharmacological agents may likewise influence chemical processes in the protoplasm without themselves being changed, but however this may be, it seems clear that the primary effect of remedial agents is exerted through their influence on cell protoplasm, the nutritional processes of which are altered, with the result that the tissues into which the protoplasm enters is altered in function.

In some instances their continued contact seems to give rise to further changes, something occurs which causes the drug molecules to lose their usual influence, and tolerance of or immunity to the drug is produced. How far this immunising effect of drugs extends we do not know. It seems to occur in certain people only in the case of arsenic. The alkaloid morphia is the best example of it, but it has been shown by Ehrlich to be produced by the two vegetable albuinoid substances, ricin and abrin. On the cause of immunisation we can only speculate. The cell protoplasm may, owing to some alteration in its functions, expel the drug with unwonted quickness, or it may destroy it, but it seems more likely that some change takes place in the nutrition of the cell which renders it insusceptible to the influence which under normal conditions alters its functions.

Turning now to the toxines it may be noted that they disturb the functions of the various organs like other pharmacological agents. They have a definite physiological action, and there is no reason for believing that they act on tissues in a manner fundamentally different from other medical agents. They have indeed a more marked power than most drugs in producing immunity. It is impossible to say whether in this respect they act like ordinary drugs, but it can hardly be doubted that they produce their effects in a similar, if not in the same way.

A third property which toxins have has not been shown to be common to the medical agents hitherto employed. They lead to the production of antitoxins, but how, we know not. Protoplasm has the power of altering substances which come in contact with it, and it is possible to imagine that by some subtle chemical influence the toxin is converted into a substance directly antagonistic to it, in physiological properties. But it seems far more probable that antitoxins are produced by the protoplasm itself under the influence which the toxin exerts upon it. It is shown that the serum of blood does contain a bactericidal substance, and many years ago Hankin pointed out that the blood of certain animals normally contains what he calls a "defensive proteid," to which Buchner subsequently gave the name of "Alexin," and which practically is an antitoxin. If cell protoplasm

has the property of thus normally producing such defensive material, it is not difficult to imagine that under the influence of certain toxins it may produce special antitoxins.

The difference between the effects of the chemical compounds which form the active principles of hitherto used drugs and the toxins, with regard to the production of antitoxins, is probably connected with the difference in chemical constitution. It is easy to understand that unstable albuminoid bodies related in composition to the protoplasm itself are likely to have special influence in producing those changes which lead to immunity and in causing the formation of antitoxin, which substances of a similar chemical composition have not. This is the more likely because, although we have no proof, so far as I am aware, that any of the older used drugs lead to the production of antitoxins, there is reason to believe that certain vegetable albuminoids are capable of doing so. Ehrlich states that the toxalbumins, abrin and ricin, derived respectively from castor oil and jequirity seeds, not only cause immunity but the formation of an antitoxin in the blood which protects from the poisonous influence of these two substances.

The method in which antitoxins act is as yet shrouded in obscurity. They may be to a certain extent destructive to the organisms giving rise to disease, as quinine probably is in ague, but they seem to produce their special effects by antagonising the toxins these organisms produce, and they differ from the older drugs in exercising a wider and more rapid influence. They seem to antagonise the toxins at once at all essential points, instead of counteracting their effects at one or two points only.

There is good reason for believing that they do not neutralise each other as an acid neutralises an alkali. At least Calmette has shown that neutralisation does not obtain in the venins and antivenins the action of which very closely resembles the toxins and antitoxins. For he finds that if a mixture of venin and antivenin, which is non-toxic because of the antagonistic influence of the two substances, be exposed to a temperature of 68°, the power of the antivenin is destroyed, but not that of the venin, which now can exert its toxic influence. It seems probable that the antitoxin acts on the molecules of the protoplasm in some way, and prevents the toxin exerting its ordinary influences. There is no reason for believing that its effects are produced in a manner different in kind to those of other drugs. The action then of the new animal substances seems not dissimilar from that of our older remedies.

But their powers widen our ideas concerning the methods in which medicines may act. They point also to possible explanations of much

which has hitherto been inscrutible. May it be, as has been suggested, that drugs do something more than influence molecular conditions; that they cause the production of something which is itself an active agent. That for example in the case of mercury it is not the metal itself which antagonises the syphilitic poison, but something which it causes the protoplasm to produce and pour into the circulation? May it be again that "toleration" is due to the fact that the older drugs as well as toxins lead to the production of a kind of antitoxin? What may be the outcome of the new discoveries we cannot distinctly see, but of this we may be quite sure, that even if the sanguine anticipations concerning these are realised, the pharmacological information which has been acquired will in no way lose its therapeutic value. We shall want drugs even though we have serums, for symptoms will have to be met, and the very character of serum precludes the hope that they can be used to treat all forms of disease.

And of this we may also be certain, a large number of observations which are the outcome of the enthusiasm excited by the new discoveries, will be fallacious, for observations, as I have said at the commencement, are biased by pre-conceived ideas. The more full our knowledge of the mode of action of the new agents the better our information about their effects on the organs and tissues—their pharmacology that is—the less likely are our judgments concerning their effects to go astray, and we must wait for this fuller information before we can use them without constant fear of evil. Knowledge of the action of drugs must be combined with careful observation of their curative influence.

It is the combination of pharmacology with therapeutics which gives the value to the work of this section, and we shall have several important discussions which will probably illustrate this. That on the treatment of syphilis will show the difficulties we labour under from defective knowledge of disease and drug action, but it will show too how patient observation, long continued, may, to some extent, make up for such defective knowledge. For nearly 300 years the use of mercury in syphilis has been debated, but because the nature of syphilis and the action of mercury was quite unknown, the utmost divergence of opinion existed in earlier times as to its use. On both points some knowledge has been gained, and differences in view are not now so wide as heretofore, yet we shall probably find that on some points observations have led to very different results.

The discussion of the treatment of insomnia will illustrate our indebtedness to the combination of pharmacological and chemical knowledge. For most of our new hypnotics we are indebted to this

joint working. Objection is sometimes taken, and with justice, to the multiplicity of similarly acting drugs brought before our notice, but it may well be that by careful observation of the exact properties of the many hypnotic agents we have now to choose from, it may be possible to fit each one in its own niche, to determine, that is, the exact conditions under which each one acts better than the rest.

The third subject for discussion -Diuretics—has in recent years been illumined by pharmacological investigations, which, though they may not have cast fresh light on the effects and importance of increasing kidney secretion, in certain forms of disease have nevertheless made more clear the manner in which diuresis may be brought about, and the indicated tissues affected in the process, thus enabling us to judge better of the kind of diuretic which should be used.

By these discussions, and the information given in the many papers which are to be read, I think we may confidently hope that something will be added at the sectional meetings to the general stock of knowledge concerning the cure of disease and the relief of suffering which is the aim and end of medicine.

THE SECTION OF PATHOLOGY.

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On the Progress and Results of Pathological work.—On such an occasion as this one is naturally tempted to look back on the history of pathology during the last sixty years, but I hope that you will not expect me to follow the fashion in this respect. To trace the history of pathology during the last sixty years would be to follow the science practically from its commencement and to go back to a state of matters which it is almost impossible for us now to realize. Even going back to the time when I was first introduced to the study of pathology, some twenty-five years ago, the changes which have taken place are enormous. At that time the lectures on pathology consisted practically entirely of morbid anatomy—long descriptions, for the most part very accurate and not materially different at the present day, were given of the naked-eye appearances of the diseased parts, but as to how or why these changes were brought about hardly any reference was made. Indeed, very little was known, and when an explanation was attempted it was generally of a mechanical or physical character. At the present time while, of course, the changes which take place in disease must be known, the study of pathology is especially directed to the discovery of the mode in which these changes occur and the reasons why they appear. To-day it is the etiological side of pathology, so to speak, which occupies our attention, and deservedly so, for, so far as practical results in the treatment of disease are concerned, the knowledge of the changes produced is of comparatively minor importance as compared with that of the reason why they are set up and how they take place. The more accurately we can trace the etiological factors in disease and the subsequent course of events, the more likely are we to arrive at a rational method of treatment.

The most striking and important advance has been the growth of the great science of bacteriology, a science which has not only led to most important practical results, but has also thrown a flood of light on the processes which go on in the body as a whole, and has stimulated research in other directions not immediately associated with it. Twenty-five years ago bacteriology as a science was non-existent. So far as I remember bacteria were not even alluded to in our course of pathology, and it was only from Lord Lister that we heard the rea

facts so far as they were known, or gained any idea of the importance of their study ; but even at that time, although his methods of treatment were already yielding brilliant results and saving many lives, and although he had deduced from clinical facts many points in the life-history of bacteria and their relations to the living body, which were only confirmed by experiment subsequently, still the number of actual proved facts was extremely few.

It is difficult for those who have only taken up the subject of bacteriology comparatively recently to realise the absolute blank which it presented even twenty years ago. When I became house-surgeon to Lord Lister in 1886 objections of all kinds were urged against the theory on which Listerism was based, some denying the existence of bacteria at all, others maintaining the theory of spontaneous generation; some asserting that organisms were always present in the healthy tissues, others denying that they had anything to do with disease, or that the success of the antiseptic principle depended in any way on the exclusion of micro-organisms from wounds. Although at the present time such an investigation would be one of the simplest, yet when I came to carry it out I was met with the greatest difficulties. Practically nothing of the kind had been done before, and all the means of investigation had to be devised. Methods of staining bacteria had not been introduced, we had no oil immersion lenses, and I very soon found that by looking at discharges from wounds containing leucocytes, granular matter, and *debris* with dry or water immersion lenses, and without substage condensors, no satisfactory result could be arrived at. Hence I came to the conclusion that attempts must be made to see whether organisms grew in suitable fluids inoculated from the discharges. Here again everything had to be devised. A suitable pabulum, methods of sterilisation, of inoculation, and of incubation had to be worked out. A large amount of time was spent in getting over the preliminary difficulties, and after a satisfactory method had been found, much labour had to be devoted to preliminary questions, such as spontaneous generation, morphological characters of bacteria, their presence or absence in the living body, conditions of growth, and so on.

A great advance which followed soon afterwards was the remarkable research of Lord Lister, on the bacterium lactis, in which he devised a method of separating bacteria by fractional cultivation, which resulted in the separation of the bacterium which causes lactic fermentation from other organisms. By this research, apart from the method, a great step was gained in the proof of the specificity of a particular bacterium, both as regards morphological characters and chemical action.

Then came Koch's work on infective diseases of wounds, and the publication of his methods of staining and examining bacteria and of cultivating them on solid media, and this work is at the foundation of all modern bacteriological research. From this period the investigations have branched off in two directions. In the first place, almost all the infective diseases have been investigated for parasitic organisms. And, in the second place, researches have been carried on in the direction of tracing out the life history and functional activity of bacteria, and of ascertaining what occurs in the body when organisms or their products are introduced.

From the latter point of view we come to another great landmark in the study of bacteriology, namely, Metchnikoff's work on phagocytosis, a theory which is not only very fascinating in itself, but which has proved a most suggestive working hypothesis leading to many of the researches which have given bacteriology its present position. What a remarkable series of views have been opened up in this direction; questions of the relation of the cells of the body to the parasite, the differentiation of cells, alterations in serum, chemiotaxis, the development of the protective agencies and of antibacteric substances, antitoxins, immunity, and so forth. And yet we are clearly only on the threshold, the very simplicity of many of the explanations is, to my mind, sufficient to show that they are incomplete, for the workings of the living body are far too intricate to be summed up in a simple formula.

In spite, however, of all that has been done, many problems still remain unsolved. In the case of tuberculosis, why is it that in one part of the body we have a slow growing lupus disease, and in another part, perhaps, of the same body, a rapidly developing tuberculosis? None of the explanations usually given, such as differences in the structure or resisting power of the tissues affected or of the individual differences in the virulence or activity of the organism, etc., seem to furnish sufficient explanation. And the same problem is apparently presented with regard to the bacilli of diphtheria, in that we may have in one case a true diphtheria, in another a membranous rhinitis, while in a third, although the bacilli are present in the throat, the individual may be apparently healthy.

Another very remarkable problem is presented by the results which follow free incisions into the tuberculous tissue. An incision is made into the abdominal cavity, masses of tuberculous tissue and tubercle are found scattered over the peritoneum, nothing whatever is done, the wound is stitched up, and yet in many cases the patient, who up to that time has been going steadily down hill, begins to pick up, and

the disease may come entirely to a standstill. This phenomenon is not limited to peritoneal tuberculosis. When I was a student the tuberculous nature of what are now recognised as tuberculous diseases of bones and joints was then only suspected, and was not generally accepted by the medical profession. At that time Lord Lister, under the impression that these diseases were of a simple inflammatory nature, and having observed the improvement which often followed free incisions into chronically inflamed tissues, began as an ordinary line of practice to make free incisions through the thickened synovial membrane of tuberculous joints with the view of relieving tension, which he looked on as the chief cause of the continuance of the trouble. Nothing else was done, the wound was not even washed out, nothing was taken away, and yet in a considerable number of cases so treated improvement began from the time that the incisions were made, the patients lost their pain, the wounds gradually healed up and the disease subsided. Even in cases in which the results were not so satisfactory it could as a rule be noted that although the swelling continued in other parts of the joint, and although the disease began again after a few weeks as vigorously as before, yet for a time at least the thickening disappeared in the neighbourhood of the scars, showing that there at any rate temporary benefit had occurred. What possible explanation can we give of such a result? The older surgeons used to speak of "setting up a healthy action in the part," and were quite satisfied with that statement. Such a view is too vague for us nowadays, but may there not be here a possible working hypothesis which if followed out might throw light on this matter? May not the occurrence of healing processes at one part influence in some way or other morbid process in the vicinity?

Again, what is the meaning of a chronic abscess? How is it that the tubercle bacilli at one time produces a quantity of tuberculous tissue, at another a cheesy mass, and at another a chronic abscess? I do not for one moment accept the view that we have in the latter case to do with a mixed infection, and that the pyogenic organisms have died out before the abscess was opened.

In connection with the pyogenic organisms also we have many problems. How is it, for example, that after an abscess is opened antiseptically suppuration at once ceases? If instead of opening the abscess antiseptically a poultice be applied, suppuration goes on and may be very profuse. But if it be opened at a time when there is free fluctuation and when it is beginning to point, and if the necessary antiseptic precautions be taken and proper drainage provided, no more pus forms, and yet when the abscess is opened it is found to

contain living pyogenic organisms. We can easily understand that the subsidence of the fever and general disturbance is due to diminished absorption of toxic products. But why do not these living pyogenic organisms keep up the suppuration? and why is it that after two or three days one may fail to obtain any cultivations from the serum which escapes from the wound? If the inflamed part be opened up antiseptically, however, at an early period, just when pus is beginning to form, there is not always the same complete absence of suppuration, although it seldom goes on to any considerable extent.

Again, an operation wound becomes septic and one naturally opens it up freely and establishes drainage; but here suppuration does not cease at once in the same typical manner as in the case of an abscess which has existed for some days. The old surgeons used to speak of an abscess being "ripe," and they allowed it to remain unopened for some days till it was pointing. They found that if they opened a deep abscess early, suppuration went on and was apt to extend. No doubt a variety of causes led to this dictum: they did not provide proper drainage; they introduced other and more vigorous organisms at the time of operation and afterwards, etc.; but do not the facts seem to indicate that, as regards the cessation of suppuration, there is some ground for this idea of ripeness. It is possible that when the abscess has attained a considerable size and the tension of the pus in it is great, the sudden release of the pent up fluid may lead to such a pouring out of serum containing antitoxic substances as to absolutely destroy the organisms present, while, the case being treated antiseptically, no fresh organisms can come in to take their place? And yet I can hardly think that that is the whole explanation.

Although it is in the department of bacteriology that the most striking advance has been made, great progress has also gone on in pathology generally, in a considerable number of cases no doubt stimulated by the results of bacteriological research, and more especially by Metchnikoff's work. The subject of inflammation has had much attention paid to it as the result of these studies, although I cannot say that to my mind it has been made any clearer. The tendency now appears to be to regard inflammation as the natural effort at repair after injury. At one time this was the view held by surgeons, and the doctrine was that inflammation was essential to healing, and in the description of healing by first intention it was stated that a red blush occurred around the wound, not so severe, however, as where suppuration takes place, and that without this red blush the edges did not adhere. When antiseptic treatment was introduced it became evident that no inflammatory blush or other sign of inflamma-

tion was necessary for healing by first intention ; in fact, it was found that wounds healed best when no visible sign of inflammation was present. I have, therefore, always taught that inflammation and healing are two different and, indeed, to some extent, antagonistic processes, and that although in every wound the tissues in resenting the injury show the early stage of inflammation, yet if no organisms be admitted the inflammatory phenomena soon pass off, and where there is destruction of tissue a second process, namely, that of repair, begins. As I have said, in recent writings the tendency appears to be to look on inflammation and healing as parts of the same process ; but, in spite of the very able arguments adduced in favour of this view, I am still unconvinced. I still look on inflammation as the mechanism which gets rid of noxious agents or neutralises their effects, and on the healing process as that which repairs defects, whether they are caused by injury and associated with inflammation or not. In fact inflammation must be followed by repair if recovery is to take place, but repair need not be preceded by inflammation. The difficulty arises from the close association of the two processes, both of which have to do with the growth of cells, and from the fact that repair follows as soon as the inflammation begins to subside. Hence under the microscope, except in cases of acute suppurative inflammation, one sees the two processes at work side by side, and it is not a matter of surprise that they should be confounded. As a matter of fact, the more the cellular processes are investigated the more it becomes evident that there is a marked differentiation of cells as regards function.

When Cohnheim first published his observations on the emigration of corpuscles, it was thought by many that the leucocyte was everything and did everything, but it was soon evident that other cells of different origin must be taken into consideration. When Metchnikoff's theory of phagocytosis first came out, some of those who adopted it assumed that all wandering cells were phagocytes ; but here, again, further investigation has shown that cells differ greatly as regards their phagocytic action. I think that a good deal of the confusion of these processes arises from the fact that expressions involving a teleological argument are very common, more especially with regard to the protective arrangements of the body. On the idea of an acting intelligence on the part of the cells, the two processes would naturally go together ; but, looked on as the simple effect of an injury, they should, I believe, be regarded as independent, and the less and the shorter the inflammation the better and quicker the healing process.

A very remarkable thing in connection with these advances, espec-

ially in experimental pathology, is the enormous direct practical benefit which has already resulted to the human race; and it is sufficient answer to the antivivisectionists who oppose the use of intelligence and observation and experiment, to point to the saving of human life and the relief of suffering which has taken place in the last few years. Since Pasteur's experiments on spontaneous generation were published, only thirty-six years have elapsed, and during that time remarkable results have been attained in treatment as the result of experimental pathology.

Scientific efforts to arrive at the truth as regards the workings of Nature are necessarily slow, and must be carried on without any regard to possible ultimate practical results. When the earlier investigators studied the phenomena of electrical action, I doubt if it ever occurred to them that the result of their study would be of any practical value, certainly they could have had no idea of the revolution which the study of electricity would effect in the history of the world. When Pasteur resolved to test the theory of spontaneous generation it did not seem likely to lead to any beneficial result; indeed, his friends tried to dissuade him from entering into what was apparently a useless investigation, and yet what numbers of human lives have been saved as the result of that work, and what incalculable benefit has accrued. It is greatly the fashion with the opponents of experimental research to demand a single instance in which an experiment has led to the discovery of a means of cure; but in no department of science has a single experiment of itself alone led to the practical result, the final observation which led to the practical result has been built up on numerous and laborious preliminary investigations and observations. And similarly, in regard to the cure or prevention of disease, the final trials on man have been led up to by numerous preceding observations and experiments. If these deluded people had their way, the result would be that experiments would be limited to man, and everyone to whom a new idea occurred would apply it without any previous investigation—surely an appalling prospect, whether for physician or patient.

The practical results already obtained affect diagnosis, prophylaxis, and treatment. The diagnosis of many parasitic diseases has now been rendered certain and easy by searching for the causal organism, and I need only instance such diseases as diphtheria, tuberculosis, malaria, anthrax, gonorrhœa, etc. And it is not only by the discovery of the parasite that diagnosis is assisted, but also by other effects of the organism such as the sort of changes set up in the tissue, the reaction to products of the organism, for instance, tuberculin and mallein,

etc., and we shall hear a good deal about one of these diagnostic advances in the course of the meeting, namely, the action of the serum of typhoid patients on motile typhoid bacilli. If no other practical advance had resulted from bacteriological work, the possibility of establishing a definite diagnosis in obscure cases is surely a gain of the utmost importance, for it enables a rational prophylaxis and treatment to be instituted.

The greatest of all the advances, because so wide reaching, has been in the prophylaxis of disease, especially in the prevention of septic disease after operation, as brought about by the discoveries of Lord Lister. By these discoveries the occurrence of sepsis in wounds made through unbroken skin is prevented, and the chances of general sepsis in septic wounds are much diminished, and numerous lives are saved, not only in this way, but also by the fact that the Listerian treatment permits the performance of live-saving operations which could not otherwise be attempted. In other cases, also, prophylaxis is of great value, as in diphtheria, and in Pasteur's treatment of rabies, which may properly be grouped as a prophylactic rather than a curative treatment.

Lastly, I may refer to advances in the cure of disease. In the case of diphtheria there can be no question that the antitoxin is a most potent curative agent, and that, used in the early stages, it is almost certain to cut short the disease. As regards tetanus, the evidence in the case of animals is absolutely convincing, but in patients suffering from the disease the effect is not certain, probably because we have to do with an acute illness, which runs its course before the serum has had time to act. The same may also be the case with the antistreptococcic serum, although I have great doubts of its value as a curative agent. In other instances, such as plague and snakebite, we may apparently look forward to a cure; while researches are being carried on with regard to pneumonia which may lead to valuable results; nor must I forget to mention Pasteur's system of inoculating cattle against anthrax. What are we to say about the new tuberculin? We all know how careful an observer Koch is, and the fact that he looks on it as a valuable remedy is to my mind sufficient to make it necessary to give it a careful and hopeful trial. I must say that I have always been favourably inclined to the old tuberculin, and have regarded it in relation to phthisis like iodide of potassium in relation to syphilis, and, had I been a physician, I do not think I should have abandoned it in the hurried manner in which it was thrown aside.

But it is not only in the direction of bacteriology that advantage has resulted from pathological research. Look at the advances in

treatment from the use of organic fluids. As the result of observations on man and researches on animals as to the effects of excision of the thyroid gland attempts were made to transplant the healthy thyroid gland into animals and patients in whom it was absent, and following these attempts the use of thyroid extract has ultimately come to be a recognised method of treatment. There is, perhaps, nothing more striking in medical treatment than the rapid and remarkable improvement in cases of myxœdema from the use of thyroid extract.

I might enumerate many other instances of direct benefit from pathological research, such as the advances in the treatment of tuberculous diseases of bones and joints as the result of better knowledge of the nature and distribution of the disease, the treatment of appendicitis, and the investigations on peritonitis and diseases of the appendix, the more complete operations for cancer following fuller study of the mode of spread of the disease, and so on; but I have said enough to show the great importance and value of pathological research. Such results must encourage us to go on working with all our might and without ceasing, bearing in mind that many are suffering and dying every day who might be saved if only we had just a little more knowledge of the workings of the body and the processes of disease.

But while pathologists are thus working out problems which affect the general well-being of mankind, and the solution of which can be of no personal gain to themselves, is it too much to ask mankind to furnish the means for such research? The English are looked on as a thoroughly practical people, and yet it is a very remarkable thing that England is almost the only country which does not realise the importance of scientific research, and the result is that in England, with very few exceptions, men who might otherwise have thrown much light on these matters are compelled to turn their attention to practice in order to make a living. Unless work of this kind is done how can we hope to advance with any rapidity in the treatment and cure of disease; the surgeon or physician must wait till the information of which he is urgently in need has been acquired for him by the pathologist. Such apathy can surely only be the result of ignorance. A rich man affected with an obscure or incurable malady cannot understand how it is that he fails to obtain the definite opinion or the relief which he so earnestly desires, and for which he is prepared to pay any price. Surely if he understood the meaning and importance of pathological research, and that the practising physician can only apply and carry out what is taught by the pathologist, he would bestir himself to aid research in order to gather information which might be of much use to him and to others.

THE SECTION OF PSYCHOLOGY.

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Mental Evolution in Man—About sixty years ago now, in the time of the Millerite excitement, a man who believed that the world was about to end expressed his fears to Emerson, who replied that it was really a matter of little consequence, "for," said he, "we can do very well without it." There are wise men who teach that each man creates the world he lives in, and as he gives in its substance so also does he give in it its quality, insomuch that it is good or bad as he is good or bad. Be this as it may, it is certain that each one of us is of more consequence to himself than is all the outside world, be it shadowy or be it solid; be it created by each inhabitant or be it independent and self-existent. Not only so, but the essential part of each man is what we call his mind, in comparison to which the body is an insignificant factor.

The Study of Psychology.—This being granted, it would seem to follow that psychology ought to be the most interesting of all the sciences, and as a matter of fact, it undoubtedly is so, though it has been greatly discredited by the imperfection of the method by which it has until very lately been studied. That imperfection is so great that it would hardly be an exaggeration to assert that nearly all the study and thought expended upon it down to the beginning of our own age has been fruitless and as good as wasted, except inasmuch as it has at last made clear the impossibility of the route men have sought to follow, the route, namely, of introspection. For we might as well study the human body alone without reference to that of any other creature, and attempt in that way to decipher its genesis, development, and meaning as to attempt to comprehend a single human mind without including in our examination not only other human minds in all stages of evolution, but equally all other minds to which our own is related—that is to say, all minds other than human belonging to our kinsfolk the animals, minds which stand to-day like mile posts along the almost infinite length of the path which our mind has followed in its upward march across the immensities and eternities from its remote infancy to the present hour; minds in which a thousand faculties represent to us everywhere, in infinite sameness and variety, replicas of our own or of parts of our

own, showing us, as the poet says, tokens of ourselves which we "negligently dropped as passed that way huge times ago."

Comparative Psychology.—As man's bodily life rests upon and grows from that of countless prehuman ancestors ; as man includes in his structure the heart of the reptile, the gills of the fish, as well as the forms in outline of innumerable still lower races, so is his so-called human mind rooted in the senses and instincts of all his ancestral species ; and not only so, but these senses and instincts still live in him, making up, indeed, far the larger part of his current every-day life ; while his higher psychical life is merely the outgrowth and flower of them.

As truly as the plant is an embodiment of inorganic matter vivified by the transmuted forces, which in the non-vital world about us we call light and heat, so truly is man's mind made the outcome of—the expansion and culmination of—the imperfect sensation of the worm, the rudimentary sight, hearing, and taste of the fish and reptile ; and the simple consciousness which, springing from these, passed to us after almost infinite ages of slow evolution and amelioration through tens of thousands of generations of placental mammals our immediate progenitors.

In the growth of mind, whether that of the race or of an individual, we recognise two distinct processes : First, the very gradual evolution to, or toward, perfection of faculties that have already come into existence ; and, secondly, the springing into existence (as new branches start from a growing tree) of faculties which had previously no existence. For it is clear to the least thoughtful student that no faculty (as no organ) came into mature and perfect life at once. Hearing and sight, we are told, developed by slow degrees from the sense of touch ; and in the region of the intellect conceptual life was born from ages of receptual, and that from millenniums of perceptual.

Mental Growth in the Individual and in the Race.—Let us now suppose mind growing for millions of years in the way set forth. It begins, we will say, as mere excitability ; to that after a long time is added what may be called discrimination, or choice and rejection of, for instance, different kinds of food. After another long interval of almost infinitely slow advance sensation appears, and with it the capacity of pleasure and of pain ; then, still later, memory ; by and by recognition of offspring ; and successively thereafter arise reason, recognition of individuals, and communication of ideas. Concurrently with these intellectual faculties, certain moral functions, such as fear, surprise, jealousy, anger, affection, play, sympathy, emulation, pride, resentment, grief, hate, revenge, shame, remorse, and a sense of the

ludicrous have also arisen in the nascent mind. We have reached now the mental plane of the higher animals, which is equally that of the human being at about two years of age. Then occurs in the child the mental expansion which separates man from the higher mammals—for something like a year the child mind steadily grows from the status of the latter to the status of the human mind. This year in the individual, during which it walks erect but possesses a receptual intelligence only, not having yet the power of forming either concepts or true words, represents in the race the age of *alalus homo*, the period of perhaps a hundred thousand years, during which our ancestors walked erect, but not having self-consciousness had no true language. At the average age of three years in the individual self-consciousness is born, and the infant, from the point of view of psychology, has become a human being. But we all know that after the attainment of the distinctively human faculty, self-consciousness, the child has still much to acquire both in the way of expansion of already possessed faculties, and in the acquisition of new ones before it is mentally a mature man. Of the numerous faculties it still has to acquire I shall only mention here the colour sense, the sense of fragrance, the human moral nature, and the musical sense. A consideration of these four and of self-consciousness will occupy the short time allotted me to-day.

And first a word as to the basic and master human faculty self-consciousness. It occurs, as said, at about the average age of 3 years; but when it first made its appearance in the race it must have done so at full maturity; perhaps at the age of 20, both life and childhood being shorter at that time than they are to-day. You will see at once why I say self-consciousness must have occurred at first at maturity. Its acquisition at a given epoch supposed a higher mental life than had hitherto existed—such higher life on the part of the race could not have come to the individual before his maturity. To suppose that would be (if you will think of it) a contradiction in terms. The human mind attains its high mark at maturity (that is what the word means), and one generation could not reach before maturity what the preceding had not reached at all. Well, but self-consciousness occurs to-day at 3 years of age, and we only reach full mental maturity (on the average) at the age of 35. The advance then made by the individual from the age of 3 to that of 35 represents the advance of the race between the date of the appearance of self-consciousness and to-day, the mental status of the 3-year-old child to-day being the mental status of the adult when self-consciousness first appeared. How long has it taken the human mind to grow from mere self-consciousness to its present stature? Not less certainly than several hundred thou-

sand years. Whatever the time required is the time during which man has inhabited the earth.

Of all the mental faculties below self-consciousness each one has its own time for appearing in the human infant—as, for instance, memory and simple consciousness appear within a few days after birth, curiosity ten weeks after, use of tools twelve months after, shame, remorse, and a sense of the ludicrous—all of them 15 months after birth. Now, it is to be noted that in every instance the time of the appearance of a faculty in the infant corresponds with the stage at which the same faculty appears (as far as can be at present ascertained) in the ascending animal scale; for instance, memory and simple consciousness occur in animals as primitive as the echinodermata, while the use of tools is not met with below monkeys, and shame, remorse, and a sense of the ludicrous are almost, if not entirely, confined (among animals) to the anthropoid ape and the dog.

To turn now to the true subject of this paper I want to say in the first place that as in prehuman so in human psychology each superadded faculty was acquired in the history of the race, and that that historic period corresponds with the time in the life of the individual into whom the faculty is born to-day. For instance, self-consciousness appears in the individual at the age of about 3 years—it appeared in the race several hundred thousand years ago. It has been proved by Geiger and others that our color sense has been acquired by the race not more than about thirty thousand years ago. Well, it is acquired by the individual at the age of about 5 or 6. It is thought that the sense of fragrance was acquired by the race later than the colour sense; it is also acquired later by the individual. Some considerable study of history has led me to the conclusion that our human moral nature cannot be more than ten thousand years old. For a careful consideration of the records that have come down to us from the early Romans, Hellenes, Hebrews, Egyptians, Assyrians and Babylonians would indicate, I think unmistakably that, as we go back into the past, this faculty tapers down towards the vanishing point, and that if it continues so to taper as we ascend the ages all of what we distinctively call our human moral nature would certainly have disappeared by the time we had gone back the number of centuries mentioned—that is ten thousand years.

Well, to-day the human moral nature in the individual, instead of being born at the age of 3 years as is self-consciousness, or at 5 or 6 as is the colour sense, does not come into existence before the average age of about 15 years. As to the musical sense, it is almost certainly less than five thousand years old in the race,

and, when it occurs at all, is not usually born in the individual before adolescence.

There are three other laws, each well worthy of notice, which govern the acquisition of new faculties by any given race. They are as follows :

1. The longer a race has been in possession of a given faculty the more universal will that faculty be in the race. This proposition scarcely needs proof—every new faculty must occur first of all in one individual, and as other individuals attain to the status of that one they too will acquire it, until after perhaps many thousands of years the whole race having attained to that status the faculty shall become universal.

2. The longer a race has been in possession of a given faculty the more firmly is that faculty fixed in each individual of the race who possesses it. In other words : The more recent is any given faculty the more easily is it lost. High authority, such as that of Charles Darwin, could be quoted in support of this proposition ; it is almost, if not quite, a self-evident proposition.

3. A study of dreaming seems to reveal the fact that in sleep such mind as we have differs from our waking mind, especially by being more primitive ; that in fact it would be almost strictly true to say that in dreams we pass backward into a pre-human mental life ; that the intellectual faculties which we possess in dreams are, especially, recepts, as distinguished from our waking concepts ; while in the moral realm they are those facilities, such as remorse, shame, surprise, along with the older and moral basic sense functions, which belonged to us before we reached the human plane, and that the more modern and mental faculties such as colour, sense, musical sense, self-consciousness, the human moral nature, have no existence in this condition, or if any of them do occur it is only as a rare exception.

Let us now compare, one with the other, a few of the faculties which have been already mentioned in the light of the rules laid down. To do this, will give us, more clearly than perhaps anything else could, a definite notion of the growth of mind by the successive addition of new functions. For this purpose we will take simple consciousness, colour sense, the human moral nature, and the musical sense.

Simple Consciousness.—Simple consciousness makes its appearance in the human infant at the age of a few days ; it is absolutely universal in the human race ; it dates back certainly to the earliest mammals, and probably much earlier ; it is only lost in deep sleep and coma ; it is present in all dreams.

Shame.—Shame is said to be born in the human infant at the age of 15 months ; it is a pre-human faculty, being found in the dog and in apes, and undoubtedly existed in our pre-human ancestry ; it is almost universal in the race, being only absent in the lowest idiots ; it is very common in dreams.

Self-Consciousness.—Self-consciousness makes its appearance in the child at the average age of 3 years ; it is not present in any species, but the human ; it is, in fact, that faculty the possession of which by an individual constitutes him a man. It is not universal in our race, being absent in all true idiots : that is, it is permanently absent in about one in each thousand human beings born into the world. In our ancestry it dates back to the first true man ; a race, we are told, unclothed, walking erect, gregarious, without a true language, to a limited extent tool-using, destitute of marriage, government, or of any institution, animal, but in virtue of its highly developed receptual intelligence, king of animals, which developed self-consciousness, and by that fact become men. It is impossible to say how long ago it was when this event occurred, but it could not have been less than several hundred thousand years. This faculty is lost much more easily and frequently than is simple consciousness. We lose it in coma and also often in the delirium of fever ; in certain forms of insanity, as in mania, it is often lost for weeks, even months at a time : and lastly, it is never present in dreams.

Colour Sense.—I have elsewhere written at large on the colour sense, and have only space here to give the facts which bear on the present inquiry. That these are facts, the argument referred to, I think, demonstrates. This faculty appears in the individual at the average age of about 5 years. It is absent in one adult human being out of every forty-seven ; it appeared in our ancestors, as Geiger has shown from linguistic paleonotology, in the Aryan period, probably less than 30,000 years ago. It is seldom present in dreams, and when it does occur, that is when any colour is seen in a dream, it is generally that colour which for good reasons was first perceived by man, namely, red.

The following occurrence illustrates (I think in a striking manner) the usual absence of the colour sense during the partial consciousness which occurs in sleep. A man whose hair is white dreamed that he was looking in a glass and saw that his hair was not only much thicker than he knew it to be in fact, but instead of being white, as he also knew it to be, it was black. Now, he well remembered in his dream that his hair had never been black. It had, in fact, been a light brown. He wondered (it is worth mentioning here that wonder

or surprise is a pre-human faculty, and is common in dreams) in his dream that his hair should be black, remembering distinctly that it had never been so. (I may say here that memory is a pre-human faculty, and is common in dreams). The important thing to note about the dream under consideration is that, though it was clear to the dreamer's mind that his hair had never been black, yet he did not remember that it had been brown. For some reason (and I think the reason is quite clear) there was a difficulty in calling up before consciousness any colour.

Moral Nature.—The human moral nature belongs to a much later stage of evolution than any of the faculties so far considered. It does not make its appearance in the individual before the average age of 15 years. It is congenitally and permanently absent in at least forty human beings out of every thousand. It would seem clear, as stated already, from a consideration of our historic ancestors, from the fact that this faculty rapidly fades out as we ascend into the past, that it cannot have existed in the race more than 10,000 years at the most. It is far more unstable in the individual than the older faculties such as self-consciousness. It is never present in dreams.

Musical Sense.—Finally, the musical sense (a faculty which is now in act of being born into the race) does not appear in the individual before the average age of about 20 years. It does not exist in more than half the members of the race. It has existed less (perhaps considerably less) than 5,000 years in the race. It is never, or almost never, present in dreams, even in the case of professional musicians.

The Scheme of Mental Evolution.—You see now clearly the scheme upon which I suppose the mind (as far as we have got) to have been built. I say advisedly "as far as we have got," because, if the mind has grown in the way set forth, it is still growing and is not built, but is in the act of building. No man can ever say positively that his theory (of any fact) is the true one, but I am prepared to say of the above hypothesis that, if it be accepted, it will enable us to understand something of the phenomena of mind as we observe it, whereas if we should prefer to hold, as many do, that the human mind was created independently of any that preceded it by a fiat and *per saltum*, then I say deliberately that there is and can be no such thing as a science of psychology, and that every attempt to investigate or explain, to comprehend or divine the rationale of the facts observed as to its origin and growth in the individual must remain for ever futile. And if I could find the right words I would bring home to each one who hears me the inextinguishable conviction that, in this idea of evolution lies enfolded the mystery of the past, the explana-

tion of the present, and the sure prescience of the future—what we were, what we are, and what we shall be.

The Atavistic Theory of Idiocy and Insanity.—In conclusion, I desire to refer briefly to two corollaries which flow from this hypothesis. The first is, that if it is correct, then all forms of insanity, including all forms of idiocy, are nothing more nor less than cases of atavism. In this view insanity is due to congenital absence or imperfection (leading to breakdown) of some faculty or faculties, such absence or imperfection being due to more or less complete reversion to an ancestral type. In my opinion this view explains insanity and its numerous forms more completely than these can be explained from any other point of view, and is therefore of great value to the thoughtful student of these phenomena. Upon this view, the comparatively recent origin and rapid evolution of the human mind, and especially the rapid mental evolution of the so-called Aryan peoples in the last four or five thousand years, is almost solely responsible for the large number of cases of insanity in the modern civilized world, since the stability of any form, function, or faculty in any race is dependent upon the time it has existed in that race, and therefore the more recent a faculty is in a race the more frequently will it be found absent, defective, or unstable in the individuals of the race.

Future Development of Mind.—The second corollary, which is even more important than the first, is that, upon the view here set forth, the human mind at present is not formed, but forming, is not completed, but in process of construction. By slow and dubious steps taken in darkness our remote ancestors wearily climbed to simple consciousness. After another immense interval they reached self-consciousness. But that cannot be the end—the cosmic process cannot stop there—cannot indeed stop anywhere. Evolution, as far as we can see, has always gone on, is going on to-day, and will always go on. Our old mental faculties are some of them fading out, others advancing toward greater perfection, and alongside of them new ones are springing up, some of which will, without doubt, be of overshadowing importance in the future.

So-called telepathy and clairvoyance seem to be specimens of such nascent faculties. I place in the same class the phenomena of what is often named spiritualism. The labours of the Society for Psychical Research have made it to me plain that these phenomena as notably in the case of W. Stainton Moses, really exist. And I think that a study of the above-mentioned case, together with that of Mrs. Piper and that of Mary J. Fancher, of Brooklyn, would compel any unprejudiced person to make the same admission. But to me these are not

cases in which outside agents are acting on or through a human being, but are cases in which a given human being has faculties which are not commonly possessed. Whether any given faculty, such as one of those now alluded to, shall grow, become common, and finally universal in the race, or wither and disappear, will depend upon the general laws of natural selection, and upon whether the possession of the nascent faculty is advantageous or not to the individual and to the race.

But of infinitely more importance than telepathy and so-called spiritualism (no matter what explanation we give of these, or what their future is destined to be) is the final fact to be here touched upon. This is that superimposed upon self-consciousness, as is that faculty upon simple consciousness, a third and higher form of consciousness is at present making it appearance in our race. This higher form of consciousness when it appears occurs, as it must, at the full maturity of the individual, at about the age of 35, but almost always between the ages of 30 and 40. There have been occasional cases of it for the last 2,000 years, and it is becoming more and more common. In fact in all respects, as far as observed, it obeys the laws to which every nascent faculty is subject. Many more or less perfect examples of this new faculty exist in the world to-day, and it has been my privilege to know personally, and to have had the opportunity of studying, several men and women who have possessed it. In the course of a few more milleniums there should be born from the present human race a higher type of man possessing this higher consciousness. This new race, as it may well be called, would occupy, as toward us, a position such as that occupied by us toward the simple conscious *alalus homo*. The advent of this higher, better, and happier race would amply justify the long agony of its birth through the countless ages of our past. And it is the first article of my belief, some of the grounds of which I have endeavoured to lay before you, that a race is in course of evolution.

THE SECTION OF DERMATOLOGY.

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The Rise and Progress of Dermatology.—The present is a time of jubilees and centenaries—occasions which we, in common with toilers in other fields, celebrate by reviewing the progress that has been made, and giving thanks to God that we are not as our predecessors were a hundred or even fifty years ago. The custom might at first sight seem to have a tendency to engender a feeling of Pharisaic self-complacency. In reality, however, such retrospects have a chastening effect, as showing that, if we have any reason to look upon ourselves as just in a scientific sense, that is largely the result not of our own merits but of those of the men who prepared the way for us. They have the still greater advantage of enabling us to see exactly where we stand in knowledge of the things which form the object of our study by showing us what has been done and what yet remains to do. As embryology furnishes the key to the riddles of anatomy, so the history of the evolution of any branch of science throws light on many points that would otherwise be dark, explains the origin of terms and theories, rescues from oblivion truths overlooked or forgotten, and, showing the pitfalls which hindered those who have gone before, teaches us to walk more warily.

It is remarkable that in the journalistic pæans in which the triumphs of medicine in the glorious reign of Queen Victoria have lately been recounted, dermatology has had no part. Why should this branch of our art be thus unhonoured and unsung? It is a form of specialism, no doubt; but specialism is no longer looked upon as an unclean thing—except by some survivor of an antique world here and there. Dermatology, although its victories have perhaps been less showy than those won in some other special departments, has not lagged behind in the onward march of medicine. It has therefore seemed to me that I might on the present occasion fitly endeavour to supply the missing cord in the great *Jubilate* whose echoes are still ringing in our ears. A review of the progress that has been made in the knowledge of skin diseases is all the more appropriate at the present time, since what I take leave to call the centenary of the birth of scientific dermatology is not long past. In 1790 the Medical Society of London awarded the Fothergillian gold medal to Robert Willan, who had some time before submitted to it the outline of his plan for

the arrangement and description of cutaneous diseases.[1] Willan may justly be called the creator of dermatology. Before him the skin was looked upon more as a mirror on whose face internal disease "glassed itself in tempest" than as an important organ subject to manifold disorders peculiar to itself. A review of the development of this branch of medicine during the past hundred years is therefore virtually a history of it from its beginning. This, of course, cannot be told in detail here, although a full record of the work of the makers of dermatology would certainly not be lacking either in interest or in usefulness. All that can be attempted in the time at my disposal is a rapid sketch of the principal changes in the conceptions of skin diseases and in the manner of treating them that have taken place since Willan reclaimed this waste land of pathology and brought it under scientific cultivation.

Forerunners of Willan—Willan was not the first who wrote on skin disease. As our terminology bears witness, the Greeks gave a good deal of attention to the subject. Hippocrates speaks of "pityriasis," "lichen." "herpes," "pomphi," and many other forms of curtaneous lesion, and roughly classifies them. Later Celsus, Galen, Paul of Ægina, and after them the Arabians, described various affections of the integument. The mediæval writers might have said with Browning's Karshish,

> Scalp disease
> Confounds me, crossing so with leprosy.

Much of the skin disease they saw was leprosy, and they doubtless often imagined it where it did not exist. At a later period syphilis overshadowed everything.

The first treatise professedly devoted to diseases of the skin was that of Hieronymus Mercusialis of Venice, which was published in 1572 under the title *De Morbis Cutaneis et de Omnibus Corporis Excrementis;* the author had, however, nothing to teach beyond what he found in the ancient writers. In the early part of the eighteenth century Daniel Turner produced *A Treatise of Diseases Incident to the Skin,* which appeared with the *imprimatur* of the President and Censors of the Royal College of Physicians of London, to whom it was offered in an "Epistle Dedicatory" in 1712. Turner's work, though it is described by Kaposi as "very important," is almost wholly a compilation from other writers, and treats not of the skin alone, but of all "distempers" affecting "the outward Parts or Confines, as may be said of the Human Body." Thus, not only the eruptive fevers, the "green sickness" and the "yellow jaundice," but phimosis, and paraphimosis, hæmorrhoids, "chaps on the fundament,"

imperforate conditions of the natural passages of the body, ulcerations of all kinds, burns, stings and bites of venomous creatures, hydrophobia and poisonous wounds, are looked upon by the author as falling within his province.

Later in the same century there appeared almost simultaneously two works, each of which in its own way marked a distinct advance towards a scientific dermatology. In a book entitled *Doctrina de Morbis Cutaneis*, which was published at Vienna in 1776, Joseph Jacob von Plenck for the first time attempted a complete classification of diseases of the skin. He arranged them, according to what appeared to him to be the most charactertistic objective feature, in 14 groups with 120 varieties. In his *Tractatus de Morbis Cutaneis*, published in Paris in 1777, Lorry, besides giving good descriptions of clinical phenomena, discussed the pathology of cutaneous affections in the light of the knowledge of the structure of the skin and the morbid processes of which it might be the seat that existed in his day.

But these were voices of men crying in the wilderness, and neither Plenck or Lorry,—meritorious as were the works of both—did much to dissipate the darkness that was upon the face of this branch of medicine. At the beginning of the nineteenth century it could be said with perfect truth that little improvement had been made in the subject at large since the days of Avicenna[2]

The Birth of Dermatology—In 1808 they appeared the first volume of Willan's treatise *On Cutaneous Diseases*, a great work which its author did not live to complete. Ten years before he had given to the world a slender volume dealing with a particular class of lesions of the skin.[3] Willan set himself the task of reducing the chaos of skin diseases to something like a cosmos. The following are, in his own words, the object at which he aimed in the execution of this design ;

1, To fix the sense of the terms employed by proper definitions.

2. To constitute general divisions or orders of the diseases from leading and peculiar circumstances in their appearance ; to arrange them into distinct genera ; and to describe at large their specific forms or varieties.

3. To classify and give names to such as have not been hitherto sufficiently distinguished.

4. To specify the mode of treatment for each disease.

Like Plenck, Willan grouped skin diseases according to the character of the predominant lesion ; and indeed there can be little doubt that he took the groundwork of his classification from Plenck.[4] The English dermatoligist, however, reduced the fourteen orders of

his Austrian forerunner to seven, "to be characterized by the different appearances of papulæ, scales, rashes, vesicles, pustules, tubercles, and maculæ." To these another order, "bullæ," was afterwards added. This classification is of course very defective, inasmuch as it takes account only of the outward and visible signs and results of disordered action. As the skin has but a limited range of pathological expression, lesions identical in appearance and in structure are produced by widely different causes. Hence a classification based solely on objective appearances inevitably led to the formation of motley groups including conditions having no essential feature in common; wherein, for instance, variola was classed with scabies as being "pustular," and varicella with eczema as "vesicular," diseases. Moreover, as in the evolution of many affections of the skin, the lesions run through almost the whole gamut of differences in appearance which constitute the several "orders," it is unsafe to look only at them in seeking for the distinctive character of such diseases. But Willan's classification, defective as it was at least introduced a definite principle of arrangement into a reign of pathology where before all was "most admired disorder." If he got the idea from Plenck, he must be allowed the credit of having greatly bettered the instruction which he received, and of having presented it to the medical world in such a manner as to impress on the mind of the profession.

It is not, however; Willan's classification that constitutes his chief title to be regarded as the founder of dermatology. His judicious selection and accurate definition of terms; his astonishingly faithful word pictures of the appearances of disease drawn directly from Nature, and made more vivid but scarcely more graphic by the coloured engravings with which he supplemented his descriptions, and his rational methods of treatment, were all his own. It was his teaching that transformed a confused jumble of folklore as to "tetters," wet and dry, and of figments of the medical imagination embodied in words of learned sound but little meaning into a science, rudimentary indeed, but grounded on a solid foundation of observed fact. Willan's work is, therefore, rightly looked upon as the true starting point in the history of dermatology.

The English School—Willan died before he could complete his work; but, fortunately, he left behind a disciple well worthy to wear his mantle. This was Thomas Bateman, who had been in constant intercourse with him for many years, and who was thoroughly acquainted not only with the teaching but with the spirit of his "learned preceptor." Bateman completed Willan's unfinished *Delineations of Cutaneous Diseases*, and published a *Practical Synopsis of*

Cutaneous Diseases, which did far more to make his master's work known than Willan's own unwieldy and incomplete book. It is hardly too much to say that without Bateman Willan might have been forgotten. Bateman, however, was not a mere expositor; he was a man of truly scientific mind, and would doubtless have added largely to knowledge had not he, too, been cut off prematurely.

Bateman's *Synopsis* ran through several editions in his life-time, and afterwards found an editor in Anthony Todd Thomson, who also published an *Atlas of Delineations of Cutaneous Eruptions* illustrative of the descriptions in Bateman's book. Thomson paid special attention to diseases of the skin for more than thirty years. He was an accurate observer, and was very successful in treatment. Towards the end of his life he embodied the fruits of his experience in a *Practical Treatise on Diseases Affecting the Skin,* which, however, he did not live to finish; it was completed by his nephew, Edmund Alexander Parkes, who was familiar with Thomson's opinions and methods of treatment in cutaneous diseases, and published in 1850. Thomson held that there could be "scarcely any difference of opinion respecting the necessity of arranging the tribe of those diseases.... (of the skin) according to the physical characters of the eruptions," and in adopting this method he chose "as the least exceptionable the orders of Willan."[5] But although "forced," as he says, to adopt the arrangement, he was careful to guard himself against the supposition that he regarded "the knowledge of their physical characters as throwing any light upon the nature of the diseases which originate the eruptions."

Thomson was physician to University College Hospital, where he was the first of what may be called a dermatological succession, which, handed on in turn by Parkes, Hillier, and Tilbury Fox, is still worthily continued by Radcliffe Crocker.

Almost simultaneously with the treatise of Thomson and Parkes there appeared a work which is one of the landmarks in the history of the English school of dermatology. This was Erasmus Wilson's *Diseases of the Skin,* the preface to which is dated 1851. Wilson, who had commenced his scientific career as an anatomist, had already done a good deal of work in dermatology, particularly in the microscopic study of the cutaneous tissues. He made a new classification of skin affections, grouping them according to the structure in which the morbid process orginated into four primary divisions: (1) Diseases of therma; (2) diseases of the sudoriparous glands; (3) diseases of the sebiparous glands; (4) diseases of the hairs and hair follicles. Each of them included numerous secondary divisions,

corresponding to the manner in which the structure was changed or the function disordered. Wilson's influence was for a long time predominant among his own countrymen, and by workers in other countries he was looked upon as the foremost representative of British dermatology. He had an eye for form and colour, and often found the right word to express them. His descriptions of diseased conditions are thus almost unrivalled in their picturesque and yet faithful rendering of appearances. He added little, however, to our knowledge of the pathology and therapeutics of skin diseases, and added not a little to the confusion which existed on the subject by his artificial classification and his ever-changing nomenclature.

On the work of the living leader of our British school of dermatology, Mr. Jonathan Hutchinson, it is not fitting to dwell here. It may, however, be permissible to say that he has brought to the study of the pathology of the skin a knowledge of disease in general such as probably no other dermatologist has ever possessed. This, together with a marked originality and independence of mind, and a singular power of seeing points of likeness in things to outward seeming most unlike, has enabled him to throw an unexpected light on many dark places of dermatology.

On the whole it may be said that the charactertistics of the British school of dermatology are those commonly held to be distinctive of the British intellect in whatever sphere it is set to work. We are a practical people, loving facts and caring little for theories. Accordingly British dermatologists from Willan to Hutchinson have been first of all observers. They have striven to get at what Majendie called the *fait brut*, to see things as they really are, and to describe what they saw as faithfully as they could. They have been distrustful of generalisations and cautious—perhaps over cautious—in deductions. But the facts gathered by them have endured while theories and systems have followed each other into nothingness; and dermatology as it exists to-day is largely the work of their hands.

The French School—In France a school of dermatology arose independently in the early years of the century. In 1808 Alibert published his *Description des Maladies de la Peau observées à l'Hôspital Saint Louis*, which he followed up two years later by a *Traité Théorique et Pratique des Maladies de la Peau* and several other works. The most valuable part of his publications was the illustrations; his writings only added to the darkness in which the whole subject of diseases of the skin was then enshrouded. His terminology was to the last degree confusing, his classification arbitrary, his descriptions often fanciful. Yet he contributed to the

advance of knowledge by directing the attention of more scientifically-minded workers to the subject. Among these was Biett, who adopted Willan's classification with some modifications and introduced it into France. Biett taught for many years at St. Louis, but the only record of his observations and experience is contained in the *Abrégé Pratique de Maladies de la Peau* of his pupils Cazenave and Schedel, which appeared in 1828. Yet, though he published nothing in the ordinary way, his teaching had a much more far-reaching influence than that of Alibert. In 1831 Rayer sketched out a plan of classification of skin diseases on a basis of morbid anatomy, dividing them into: (1) Inflammation; (2) morbid scretions; (3) congestions and hæmorrhages; (4) anæmias; (5) neuroses; and (6) deformities—thus anticipating Hebra in principle and to a considerable extent, in detail. Rayer's work is a mine of information as to the early literature of dermatology, and embodied the results of extensive clinical observations so accurate and so clearly recorded that much of it is of permanent value.

Among the leaders of the French school who followed Biett were, Cazenave, Gibert, Devergie, and Bazin, all of whom did something to advance the knowledge of skin diseases, though they were apt to let themselves be misled by a tendency to erect systems on unsound foundations. To them skin diseases were, for the most part, the expressions of some constitutional dyscrasia, which at best was an unnecessary hypothesis, and was sometimes, as in the case of the so-called "dartrous," "psoric," and "herpetic" diatheses, a myth Indeed, it may be said that in France dermatology was the "last ditch" in which these mediæval notions still fought for life. In recent years the yoke of the diatheses has been shaken off, and the labours of Hardy, Vidal, Besnier, and Brocq have placed the French school in the forefront of scientific dermatology, a position which, with such men as Darier, Thibierge, Wickham, to take the place of their seniors when they have to fall out of the ranks, it is in no danger of losing.

The German School—The year 1844 marked the beginning of a new era in the study of diseases of the skin, for it witnessed the first appearance before the scientific world of Ferdinand Hebra. That remarkable man breathed a new life into the dry bones of dermatology, and set it on a path of progress which has already led to great results. Hebra applied to the investigation of skin diseases the pathological teaching of Rokitansky. He classified them not according to their objective appearances, or to the structures supposed to be primarily or mainly affected, but according to the nature of the pathological process of which they were examples. He used the

experimental method, producing various lesions on healthy skin by artificial means, and observing the changes which they underwent when allowed to run their own course, and when modified by treatment of different kinds, In this way Hebra rationalised dermatology, ridding it of the superstitions as to dyscrasiæ with which it had before been infested, and giving to the treatment of skin disease a directness of purpose a simplicity of means undreamt of by his predecessors. Students of skin disease flocked from nearly every part of the world to sit at the feet of the Vienna Gamaliel, and the influence of his teaching was felt everywhere except in France, where, as has been said, the traditional belief in dyscrasiæ persisted till a comparatively recent period. Hebra's work has been carried on by Auspitz, Kaposi, and Neumann in Vienna, by Pick in Prague, Schwimmer in Buda-Pesth, Lewin and Lassar in Berlin, Neisser in Breslau, and many others.

If Willan was the creator, Hebra must be acknowledged as the greatest among the reformers of dermatology. This glory must be his in spite of the fact that his classification in its leading features had been anticipated by Rayer. Hebra, however, worked it out so fully as to make it his own ; and his classification, though it has necessarily been modified as knowledge grew, notably by the influence of Virchow's "cellular pathology" and by the newer bacteriological doctrine, can never be superseded till an arrangement based on etiology becomes possible. Such a classification has already been attempted by Auspitz and after him by Bronson, but the time for it is not yet.

The American School—The history of dermatology in America has been written by Professor J. C. White of Harvard, and by Professor Louis A. Duhring of Philadelphia, from whom all that can here be said on the subject is taken.[6] For the first thirty years or more of the century little or no interest was taken in cutaneous affections in America. A story is told which, whether true or not, serves to illustrate the state of things in these days. A student asking for information as to a disease of the skin from a physician, was met with the reply: 'Sir, I know nothing of the skin diseases; you must go to a surgeon." On his applying to a surgeon, the answer was: "Sir, I must refer you to the physician." In fact, Duhring tells us a disposition existed to consign the whole of this branch of medicine to those outside the professional pale. No one seemed prepared to take up the matter. Still, even at that period, there was a demand for information on skin diseases which booksellers thought it worth while to supply. Bateman's *Synopsis* was republished at Philadelphia in 1818, a second edition being issued in 1824, and a translation of

the work of Cazenave and Schedel appeared in the same city in 1829, a second edition being published in 1832. In 1845 appeared the first American work on dermatology. It was entitled *A Synopsis of the Symptoms, Diagnosis, and Treatment of the more Common and Important Diseases of the Skin*, and its author was N. Worcester, Professor of Physicial Diagnosis and General Pathology in the Medical School of Cleveland. The book is described by Duhring as being little more than a compilation from the works of the French and English dermatologists of the day.

Meanwhile, other signs of a growing interest in the subject were not wanting. In 1836, an Infirmary for Diseases of the Skin was opened in New York, being the first institution of the kind established in the United States, and lectures on skin diseases were delivered there, and afterwards in some of the medical schools of New York between the years 1837 and 1854 by Dr. H. D. Bulkley, father of Dr. L. D. Bulkley, whose name is well known to all dermatologists.

At this time Paris was the centre of the dermatological world, and American students accordingly went there for instruction in the subject. Hence for many years American dermatology was the direct offspring of the French school, the influence of which was only slightly tempered by reprints of the works of Wilson and other English writers. At a later period Americans flocked to Vienna, and on returning home spread the doctrines of Hebra among their countrymen. As early as 1859 Hebra's teaching was made known in America by Prof. James C. White, who, two years later, gave the first course of lectures on diseases of the skin at Harvard. After the Civil War clinical lectureships on the subject were established in several important schools. In 1870 the foundation of the *American Journal of Syphilography and Dermatology* did something to promote the advancement of the knowledge of skin diseases in America, and the establishment of the American Dermatological Association in 1877 gave a powerful impulse in the same direction, which was further aided by the creation of the *Archives of Dermatology*. Yet in 1871 Prof. James C. White complained that as yet America had contributed little to dermatology, and that this branch of medicine had hardly then found a place among his countrymen as an acknowledged specialty. Now this reproach has been wiped away, and American dermatology, represented by Duhring, J. C. White, Bulkley, and others, is recognized as being in the van of progress.

The Fusion of the Schools—Each of the three great schools which helped to lay the foundations of modern dermatology had certain

marked characteristics. The English was essentially clinical, using classification only as a practical help in diagnosis; it observed. The French systematised, striding somewhat impatiently over facts to get at general formulas, which though plausible on paper, to often broke down in application. The German was pathological, giving attention mainly to mechanism and occasionally taking too little heed of the causes setting it in motion. Each school had thus the defects of its qualities; but each played an important part in the development of dermatology, and much of what was good in each still survives in the cutaneous medicine of the present day.

Now, dermatology is truly international, the different schools which were formerly as separate states having become fused into one scientific commonwealth. This has been accomplished by the translation of representative works of each school into the language of the others; by the multiplication of journals devoted to this special branch of medical science in which everything of value that is published in any part of the world is gathered up and summarised; by the facilities of communication which made it easy for the scientific pilgrim to visit every dermatological shrine where his devotion is likely to be rewarded with knowledge of some new thing; and by congresses, those marts for the exchange of scientific wares which have so powerfully aided in the diffusion of knowledge, in the extinction of national jealousies, and in the correction of provincial ways of thought. Dr. Johnson when at Oxford was overheard to say that he had a mind to see what was being done in foreign universities, "for an Athenian blockhead is the worst of blockheads." He thus vigorously expressed the truth that a man trained in a particular school is apt to be narrow if he knows nothing of any other. In the sphere of dermatology this kind of narrowness was especially exemplified in the French school, but neither of the others was entirely free from it. How could it be otherwise when they knew so little of each other? How slowly the work even of so brilliant a dermatologist as Hebra became known to the profession in other countries at a time comparatively recent is shown by the following passage which I quote from Pro. James C. White. Speaking of the middle of the Fifties he says: "It was not until the intelligence began to spread, slowly borne by word of mouth from country to country, that in an Imperial city of Austria there was a man teaching skin diseases as they had never been taught before, with unlimited means of clinical illustration, with the keenest eye for observation, with an unbounded amount of information drawn from many years of experience, with a self-restraint which no desire for premature

fame could tempt into hasty publication, and with a sound and logical mind, that the German school for dermatology some fifteen years ago began to be known and to advance to that pre-eminent position it now holds." Fame flies faster nowadays, but the very ease and rapidity with which the results of a man's work can be made known now lead to the publication of much that is inaccurate observation and immature speculation.

Progress in Knowledge—Turning now from the workers to the work that has been done, the most striking feature on the dermatology of to-day as compared with that of the beginning of the century is the knowledge of the nature and causes of skin diseases that has been gained. Willan and Bateman left little in the way of outward appearances for those who came after them to describe, but no real knowledge of pathological processes was possible till the microscope and other modern methods of research were applied to the study of diseases of the skin. This is the special achievement of the German School. The attention directed to processes has led us to recognize that many conditions which used to be looked upon as distinct affections are really different stages in the evolution of one and the same disease. In this way dermatology has been greatly simplified. Compare, for instance, the modern teaching as to eczema with that of Erasmus Wilson, with his six principal varieties—erythematosum, papulosum, vesiculosum, ichorosum, pustulosum, squamosum; and his ten subvarieties—marginatum, fissum, mucosum, scabidum seu crustaceum, œdematosum, tuberculosum, spargosiforme, sclerosum, verrucosum, neurosum. Then, according to the parts attacked, there was eczema, capitis, faciei, auriculare, mamillare, umbilicale, perineale. The varities of psoriasis were still more numerous—punctata, guttata, alphoides, nummularis, scutellata, orbicularis, annulata, circinata, vulgaris, gyrata, circumscripta, diffusa, confluens, discoidea, centrifuga, imbricata, figurata, inveterata; with the local forms—palpebrarum, labialis, præputii, scrotalis et pudendalis, palmaris, unguium; it is like the catalogue of the ships that bore the Danaans to Ilios. And for a long time nearly every writer on skin diseases thought it due to himself to show his inventiveness in the same way. It is no wonder that dermatology treated in this way was a terror to students and an affliction to practitioners.

Further simplification has resulted from our having learnt to distinguish between the primary lesions which are the notes of a particular disease and the lesions which result from secondary causes, such as injury from scratching or rubbing and the invasion of pyogenic micro-organisms. Much confusion and needless multipli-

cation of types were caused in former days by mistaking the accidental for the essential in such affections as scabies, eczema, ringworm, impetigo, and other conditions liable to complication by suppurative processes.

Pathological research has done much to elucidate the nature of growths, benign and malignant, of the skin. The work of Jacob Warren, Hutchinson, Dubreuilh, and Norman Walker in regard to rodent ulcer; and that of Kaposi in regard to sarcoma of the skin and xeroderma pigmentosum mark distinct advances.

Real progress in the science of medicine, however, is measured by the increase in our knowledge of the causes of disease. In this rsspect it may, I think, be said that as much has been done in dermatology as in any branch of medicine. The etiology of a very considerable proportion of skin diseases is now accurately known. Among the causes whose operation has been clearly traced, a prominent place is occupied by inoculable viruses which infect the system, such as syphilis, tuberculosis, leprosy—to mention only the more common. Ricord, Fournier, Sigmund, and Hutchinson, have shown how many and various are the cutaneous manifestations of syphilis, and with what versatile mimicry it assumes the form of other diseases of the skin. Tuberculosis has been proved to be accountable not only for lupus, but for affections formerly classed under the heads of lichen and erythema and for the other forms of skin disease included under the general term scrofuloderma. The sorting out of the cutaneous affections due to these two causes alone has greatly reduced the region of the unknown in the map of dermatology.

The Action of Parasites—Another direction in which the etiology of skin diseases has made decided progress is the recognition of the action of parasites. The idea that scabies is due to the irritation set up in the tissues by an animalcule, and ringworm by the growth on the surface of the skin of a vegetable mould, is so familiar to us that it is not easy to realize how recently the truth of these doctrines has been definitely established, and with what incredulity the discoveries were for a long time received. The sarcoptes scabiei had been seen by Avenzoar in the twelfth century, and later by Guy de Chauliac, Ambroise Paré, and others; and in the seventeenth century it was distinctly indicated as being the cause of itch by Bonomo and Cestoni. It was rediscovered more than once afterwards, but it was not till 1834 that Renucci, in Alibert's clinic, was able to show how it could always be found.[8] Yet in 1850 Antony Todd Thomson is allowed to say, without a word of protest from his editor Parkes, that itch is certainly "the result of a morbid poison, and that the

fluid of the vesicles or the pustules is the agent transmitting the disease: and while awarding Wilson credit for his accurate description of the acarus, Thomson expresses his inability to "accord with him in attributing the disease to that insect."[9] Still later we find a dermatologist like Devergie writing: "The acarus is a morbid product of the itch as the mycoderm is the morbid product of ringworm, as the insect of acne punctata is the morbid product of that disease, as the louse is the morbid product of pediculous prurigo. Ringworm is contagious through the medium of this mycoderm not only from child to child, but from the head of a child to the bark of certain trees, and the lousy evil[10] from person to person. Ringworm, acne punctata, and the lousy evil, do they originate the less spontaneously on that account? The means that we use to destroy the acarus, are they not also suitable for curing the eruption of itch?" The fact that only forty years ago a dermatologist of the first rank could thus in one sweeping anathema condemn root and branch the doctrine of parasitism in skin diseases is one of the most striking proofs of the youthfulness of scientific dermatology, and of the progress which it has made in its lusty childhood.

The discovery of the vegetable fungi which cause ringworm, favus, tinea vericolor, and erythrasma, unlike that of the itch mite, was not made in the Dark Ages, but almost in the full glare of the light of modern science; yet it was received with equally resolute disbelief by some of the leaders in dermatological Israel. In 1839 Schoenlein discovered the fugus which produces favus; in 1844 Gruby in Paris, and Malmssen in Stockholm almost simultaneously and quite independently discovered that which causes ringworm. Here, again, we find A. T. Thomson, in 1850, asserting in regard to favus that though the disease has been ascribed to a mycoderm, "there is no proof of that opinion," and in regard to ringworm, that "the pustules constitute the disease, and the mycoderm merely finds its habitat on them."[12] In the same year Cazenave[13] could scarcely bring himself to admit the existence of the achorion Schoenleinii, and with regard to fungi in general in their relation to skin diseases, he was emphatic in warning investigators against "the illusions of microphotography," and denied that these "mysterious atoms" possessed any pathogenic property. In 1863 Chausit, a pupil of Cazenave, argued strongly against the crytogamic origin of ringworm, concluding that "in the present state of dermatology there is no disease of essentially parasitic nature, and there is no such theory as antiparastic therapeusis."[14]

Gibert, who had long been an obstinate recusant, gave in his adhesion to the parasitic doctrine in 1866, but Cazenave never re-

canted his heresy, and Erasmus Wilson, who, after Cazenave had passed away, stood alone in his refusal to accept the teachings of modern science on this subject, also died an unbeliever. The brilliant researches of M. Sabouraud have recently proved that the disease hitherto known as ringworm includes two, and possibly more, distinct conditions caused by different species of fungi. It has also been shown that the disease may be transmitted from animals—particularly the horse—to human beings, a fact obviously of the greatest practical importance. Sabouraud and other observers in other countries have thrown light on the geographical distribution of the ringworm fungus, and the remarkable fact has been brought to light that the species which causes the most rebellious form of the disease is most frequently met with in London, is unknown in Italy, and very rare in Germany. This has an obvious bearing on the records of the results of treatment in those several countries. Another point which is suggested in recent investigations is that the boundary line between ringworm and favus is by no means so definite as has hitherto been believed. It is clear that there is yet much to be done in a subject which a short time ago was looked upon as worked out, and the mycology of which may be commended to young dermatologists as a field of study likely to be fertile in results.

Bacteria and Skin Diseases—During the past few years our ideas as to the action of parasites have undergone expansion. The influence of the great revolution in pathology brought about by the discoveries of Pasteur, Koch, and their disciples has been felt in the sphere of dermatology as in other departments of medicine, and we have learnt to look for the causes of many diseases in the world of the infinitely little which bacteriology has revealed to us. Already lupus, leprosy, carbuncle, glanders, sycosis, furuncle, impetigo contagiosa have been proved to be the result of the mischievous activity of specific micro-organisms. It is practically certain that syphilis has a like origin, but the particular microbe responsible for its production is still "wanted" by our scientific police. More than one has been arrested on suspicion, others are being closely shadowed, and there is every hope that the actual criminal will soon be found. Eczema is considered by Unna, who has done much for the recent advance of dermatology, to be of microbic origin. A similar causation is assigned to psoriasis, and by others to alopecia areata, acne, and certain forms of erythema. Quite recently Sabouraud has brought forward evidence which he thinks sufficient to prove that seborrhœa and common baldness are of the bacterial family of diseases. These views are not yet accepted by all dermatologists, but there can be little doubt that

as methods of research are perfected the "the sphere of influence" of bacteriology in relation to skin diseases will become greatly enlarged. Already it extends far more widely than the brief list of diseases which have been definitely traced to microbic agency would seem to show. In almost every case of skin disease the primary and essential process is at some period of its course complicated, and it may be overshadowed by secondary lesions, To bacteriology we owe the knowledge that these are due to the action of pyococci and streptococci, whose attacks the skin resists in health, but to which it falls an easy prey when diseased. The importance of this knowledge both in relation to diagnosis and to treatment can hardly be overestimated.

Other Lines of Advance—I can make only the briefest reference to other lines along which dermatology has advanced in recent years. Of these the most important has been the increased attention bestowed on the relations of various forms of cutaneous affections to disorders of the nervous system. In this field the most notable workers have been Bärensprung, Weir Mitchell, Morvan, Schwimmer, Radcliffe, Crocker, and above all Leloir, whose untimely death was a grevious loss to dermatology. A large number of skin diseases presenting the greatest diversity in their objective features have been shown to be dependent on lesion or functional disorder of some part of the nervous system. Many diseases such as zoster, erythema, pemphigus, scleroderma, and various forms of cutaneous œdema, hæmorrhage, and ulceration which used to be called "idiopathic"—the medical equivalent for the "visitation of God" in the simple etiology of the British juryman—are now recognized to be consequences of vasomotor or trophic disturbance. We also know that defective innervation plays a considerable part as a predisposing cause, making the skin less able to resist harmful influences of any kind—injury, cold heat, and irritants, whether chemical or parastic. In this way nervous disorder comes into play as a definite factor in many cases of eczema, lichen, and other affections. The late Mr. John Marshall threw out the pregnant idea that cancer might be an "anarchy of cells" due to loss of control by the nervous system. The same cause might account for some diseases of the skin. The neuropathology of the skin is a field that will well repay further cultivation.

Another line along which we have advanced is the establishment of a definite relation between certain constitutional states and affections of the integument. The tendency of the French school to look to the general system for an explanation of every blotch and pimple led them away from the truth no doubt, even to the invention of

a diathesis when one was wanted ; but some dermatologists have perhaps now gone a little too far in the opposite direction. It is well that with the all-conquering bacillus on every side extending the boundaries of his empire, we should not forget that other agencies have still to be taken into account. Gout has not the far-reaching influence in the production of cutaneous affections that it used to be credited with ; but it is sometimes a factor that must be reckoned with. The connections of certain forms of pruritus and herpes, of boils and carbuncles, of a particular variety of xanthoma with glycosuria is well known.

The influence of auto-intoxication requires to be more thoroughly studied than it has yet been, the effects of ptomaines should also be fully investigated. The serum treatment which is now being tried in diptheria and other diseases is making us familiar with toxin rashes ; is it not possible that the prolonged operation of some similiar cause might explain the origin of some skin diseases ?

Progress in Power—Bacon's aphorism that "knowledge is power" unfortunately does not always hold good in medicine. Yet we may fairly congratulate ourselves on a very decided gain in our power of dealing with skin diseases, especially in the last fifteen years. Progress has been made in three ways: (1) We have got rid of some superstitions; (2) we know better where to direct our attack; and (3) we have more effective weapons.

Among the superstitions that hindered progress, one of the most pernicious was the notion that skin disease was a natural issue for the escape of peccant humours—a safety-valve for the constitution. Hence in many forms of skin affection, and particularly in the case of eczema, it was believed to be dangerous to cure the cutaneous lesions, because the disease was thus "driven in" upon the internal organs. As a quaint illustration of this belief the following passage from our earliest English dermatologist, Daniel Turner, is interesting. Speaking of "Children's Scabs or Breakings-out," he quotes with implied approval the following admonition from "the most excellent Hildanus":

"Let Mothers have a Care how they set about the Cure of this Malady, unless it be so virulent as to hazard corrupting the Parts it lies upon. My eldest Son (says he) till he was seven Years old had not a Speck upon his Body, wherefore I often foretold that some sudden and mortal disease would seize him ; and, indeed, being taken with a Stoppage of Urine, he died the seventh Day of the Disease of a great Inflammations of the Kidnies and Parts adjoining which turned to a Gangrene: Nature, to wit, not being able to purge the

Body of vitious Humours by the Itch, they in the seventh Year, as by a critical Expulsion, fell suddenly from other Parts upon the Loins. In my practice I have met with several Diseases both internal and external in young Children in whom these Breakings-out were either not naturally expell'd or violently dry'd up' Therefore, let the honest Physician abstain from Medicines: and if there be a Necessity. let the pain of this Itch in Chlidren be only mitigated with Fresh Butter or with the same washed in Rosewater.[15]"

Willan and the older dermatologists had the fear of "repelling" diseases of the skin ever before them. Perhaps the most grotesque instance of the superstition is a case referred to by Duhring as being recorded by a Boston Doctor. This enlightened practitioner finding two African children afflicted with body lice put them into a warm bath; on being suddenly freed by this means from their vermin, they incontinently "dropped down and expired immediately." But the fear of "driving in" skin disease is not yet by any means extinct in the medical profession or even among dermatologists; it would be easy to quote passages in proof of this from living writers of authority.

Increased precision in the direction of attack naturally arises from increase of knowledge as to the nature, and especially as to the causation, of cutaneous affections. Nowadays we at least do not, as Archbishop Whatley said of the common run of preachers, "aim at nothing and hit it." The polypharmacy in which the older school of dermatologists delighted is almost a thing of the past, and patients are not physicked in the wholesale and indiscriminate manner that used to be thought necessary for the correction of their constitutional depravity. Internal medication is used only in response to definite indications, and we work the "miracle of cure," to use a too celebrated phrase, with the help of a simpler, pleasanter, and more efficient pharmacy. The improvement in our weapons lies mainly in the methods of preparing and employing the old remedies, but newer ones are not wanting.

The administration of remedies by hypodermic injection may be mentioned as one of the most promising improvements in constitutional therapeusis; the use of mercury in this way in syphilis is becoming more and more common. The serum treatment has not yet established itself in dermatological practice, but good results from it have been reported in a few cases of syphilis, lupus, leprosy, and one or two other affections. Tuberculin as first prepared by Koch has in my own hands and in those of some other observers proved of distinct use as a preliminary to surgical treatment in lupus. The newer

tuberculin lately "placed on the market"—I am sorry to have to use this commercial phrase, but it accurately expresses the fact—gives promise of much greater usefulness, but it is too soon yet to pronounce a definite judgment as to its real efficacy. Thyroid extract has a powerful immediate effect on the integument, but my own experience does not lead me to attach much value to it as a remedy in skin disease, and that opinion is confirmed by the experience of several other dermatologists.

But it is in our means of local treatment that the improvement of our weapons is most marked. The application of the parasitic doctrine to skin diseases has led to the introduction of a large and constantly increasing use of parasiticides; in carbolic acid, boric acid, salicylic acid, resorcin, creolin, thymol, salol, dermatol ichthyol, chrysarobin, to mention only a few, we have powerful agents that the mid-century dermatologists knew not of. Then both the preparations and the methods of applying them are cleanlier and more effective. The pastes, plaster mulls, varnishes, soaps, sticks, and other devices for the application of remedies which we owe to the ingenuity of Pick, Unna, Lassar, Brooke, and others have revolutionized the local treatment of skin disease. Our surgical methods and appliances, our antiseptics, our cauteries and so forth, are also immensely superior to those in use twenty years ago.

Do we cure more than our scientific forefathers did? I think we may unhesitatingly answer, "Yes." Parasitic diseases are certainly more under our control, and in nearly every form of skin disease we can treat symptoms more effectively, and give relief even where we fail to cure. We are altogether milder in our methods than the dermatologists of a former day; we soothe instead of irritating; we strengthen instead of depleting; we leave Nature to herself instead of thwarting and teasing her into active rebellion. But there is still a good deal of over treatment and I not infrequently see patients whose disease has been aggravated into frenzy, so to speak, by the continuous goading of injudicious treatment. The policy of "masterly inactivity" finds a large sphere of application in dermatology.

I have given a review of the past, very hasty and imperfect, but I can only, like swift Camilla, skim across the plain I may be allowed to conclude with a peep into the future. Whether the newer medication with serums and organic extracts holds in it much promise for the treatment of skin diseases it is of course impossible to say; I am, however, inclined to think that in this direction, and in that of increase of power of dealing with parasitic affection lies the path of development in dermatological therapeutics likely to lead to the best

results. It will be long before a complete classification of diseases of the skin is possible, but this is of course impossible to say; I am, however, inclined to think that in this direction, and in that of increase of power of dealing with parasitic affections lies the path of development in dermatological therapeutics likely to lead to the best results. It will be long before a complete classification of diseases of the skin is possible, but this is of no great practical importance. A real stumbling block, however, is the confusion of terminology that still exists. It would be a very real help to progress if a nomenclature at once simple, precise and yet descriptive, and international could be devised.

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Original Communications.

THE VALUE OF MODIFIED COW'S MILK IN INFANT FEEDING.

BY

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My effort this evening is not to present an exhaustive study on the value of modified cow's milk in infant feeding, but rather to review briefly the principle of the use of modified cow's milk and to report the experience of others, as well as my own, in its employment and limitations in practice.

As civilization advances, a constantly increasing proportion of mothers are unable to nurse their children. Among the rich luxurious habits of life, and among the poor over crowding with its attendant evils and poor food bring about the same result, loss of the function of lactation. Substitute or artificial feeding of infants is thus becoming daily a more and more important problem.

The offspring of all mammals are carnivora, and the human infant is no exception to this rule.

The constituents of the food of all young mammals are essentially animal and never vegetable. Therefore a vegetable element in the food of young infants would seem to be a foreign element.

The theory that the addition of such elements tended to make the curd of milk finer and therefore more easily digested has been proved to be fallacious.

Empirical feeding of infants, hitherto almost universal, has ever introduced a considerable proportion of vegetable matter into infant foods.

For our present scientific method of infant feeding we are indebted chiefly to Dr. Rotch, of Boston, who, associated with Mr. G. E. Gordon, a veterinarian, has simplified the problem and brought it to such practical perfection that we can now write a prescription for a food, with the same certainty that it will be accurately filled, as when we write a prescription for an apothecary.

Maternal milk is the best food for infants and there is but little doubt that no food will ever be found which will fully supply its deficiency.

Human Milk.—Human milk must therefore be the standard we must copy.

But it is well known that human milk is subject to great variation as those who have had much experience with wet nurses know Breast milk on which one infant may thrive, may prove utterly unsuited for another of the same age and weight.

A brief review of the composition of human milk and of some of its variations may not be out of place at this point. According to the most recent analysis, the composition of human milk is as follows:

	Average.	Common Variations.
Fat	4.00	3.00 To 5.00
Sugar	7.00	6.00 " 7.00
Proteid	1.50	1.00 " 2.25
Salts	0.20	0.18 " 0.25
Water	87.30	89.82 " 85.50
	100.00	100.00 100.00

The fat is subject to considerable variation but the percentage of four is about the average. Roughly speaking the proportion of fat to proteid in human milk is three to one.

The sugar is simply lactose in solution. Its proportion varies from 6 to 7 per cent. and is very constant.

The proteids of human milk are very complex and though much work has been done upon them they are not as yet completely understood. The most important are casein, lactalbumin, and lactoglobulin. The proteids vary from 1.50 to 2 per cent. being high at first but soon averaging 1.50 per cent.

The salts are numerous but average about 0.20 per cent. and are very constant throughout lactation.

The reaction is generally slightly alkaline and it is as a rule free from germs.

The amount supplied to the infant varies from 10-16 oz. per diem at the end of the first week, to 30-40 oz. from the sixth to the ninth month.

When the analysis of human milk yielded us definite knowledge of its elements and their proportions we were in a position to look for an efficient substitute.

The milk of all animals must be modified to correspond to human milk; hence cow's milk as being most easily obtainable is best suited for the purpose.

Milk of Cows of Various Breeds.—There is not time for me to refer even briefly to the investigations which have been carried out as to the proportion of the elements in the milk of various breeds of cows. Suffice it to say that by scientific feeding and mixing of the milk of various breeds, a standard milk has been obtained ; that is a milkcontaining a fairly steady average in the percentage of the various elements.

Cow's Milk.—Cow's milk contains exactly the same constituents as human milk but in different proportions. The proportion of the elements is : Fats 4.00, sugar 4.50, proteids 4.00, ash 0.70. It is acid in reaction and is apt to be contaminated with germs.

We have thus in cow's milk, an excess of proteids and salts and a deficiency in the amount of sugar while the fat is about the same.

The problem was to obtain the elements separately, and then to recombine them to meet the need of individual cases. For the power to do this we are indebted as I said before to Dr. Rotch.

Two questions suggest themselves at this point. (1) In the process of separation of the elements will any change be brought about which would spoil them for use ? (2) Is there not some difference in the composition of the proteids of cow's milk which causes them to be more difficult of digestion by the infant ?

The process of separation has not been proved to cause any change in the elements. The emulsion of the fat is not disturbed.

The question of the proteids not yet being settled, it is difficult to say if any difference exists, but if there is it is not sufficient to be seriously considered.

Dilution with water, which is necessitated by the proteids, brings the salts down to their proper proportions, so they do not require separate consideration.

New Nomenclature.—In modern scientific feeding of infants it is necessary for the sake of accuracy to adopt a new method of nomenclature, as it were, which makes it seem at first sight a little difficult of comprehension. Instead of specifying the amount of cream and milk in a food we indicate the proportion of the elements.

This difficulty is soon mastered, as it must be, in order to properly prescribe milk in infant feeding.

It is this power of specifying the elements which enables us to modify the food to suit each individual case, as by varying the elements we can find out exactly which is at fault in the patient being fed.

We are fortunate in having in this city a milk laboratory where this process of preparing cow's milk for the scientific feeding of infants is carried out.

The Walker-Gordon Laboratory Co., has adopted the term " Modified

Milk" to designate their process of putting into effect the prescriptions of physicians upon any basis of milk they may elect to use.

These laboratories have the oversight of the feeding and care of the cows; and the handling of the milk to insure its purity, cleanliness and freshness. They have trained men to carry out the preparation of the food called for by the prescriptions.

At the present time there are about 30,000 infants being fed by these laboratories in the United States and Canada, and they are everywhere giving satisfaction.

Rotch in a recent paper said: "The position which it seems fair for us to take is that the principle of the modification of milk is scientific, is practical, is right, and that in the milk laboratory we have one more instrument of precision to aid us in our work."

In infant feeding there are three important factors. (1) Quantity. (2) Quality. (3) Idiosyncrasy. It is impossible to give exact rules for modification, but in ordering milk for an infant not only its age, but its weight must be taken into account. A large healthy child for its age requires, not infrequently, the quantity and percentage of food advised for an average child of some weeks older.

As a rule it is well to begin with a low percentage and work up till a percentage and quantity is reached which the infant will digest and gain an average amount in weight per week upon.

It is absolutely necessary to insure success, that a close watch be kept of the infant's weight. It should be weighed at least once a week. The weekly gain in a healthy infant should be from three to eight ounces; at four months an average infant should have doubled its birth-weight and at one year have trebled it.

As a rule I think there is a tendency to give an artificially fed infant too large a quantity of food.

Amount of Feeding.—During the first month of life, an average infant requires about ten feedings of from one to two ounces daily. During the second and third months, from two to four ounces and so on. As the amount is increased the number of feedings must be reduced and the interval between each lengthened.

An average formula for a healthy infant during the first week of life would be: Fat 2.00, sugar 6.00, proteid .60. The percentage may then be gradually increased to reach: Fat 3.00, sugar 6.00, proteid 1.00, by the end of the first month. By the third month a healthy infant thrives well on a fat 4.00. sugar 7.00, proteid 1.50 mixture.

As a rule those of largest experience find they get the best results from rather low percentage mixtures.

Modifications called for by Particular Symptoms,—Proteids.—The

modifications called for by particular symptoms are important. If the proteids are in excess they are passed as undigested curds in the motions. These proteid curds are small and hard. It is proteid indigestion which gives rise to most of the colic of early infancy and as a rule a proper management of the proteids means success in infant feeding. Proteid indigestion may be shown by restlessness, sometimes by diarrhœa, but more frequently by constipation; the latter is prone to occur with a great excess of proteid. Vomiting of small proteid curds is not infrequently met with.

Fat.—An excess of fat is usually shown by frequent motions of normal colour, containing large soft flocculi, which we call fat curds. Vomiting and regurgitation also occur from an excess of this element in the food. It is rare that fat indigestion is a cause of colic. Dry hard motions occur if the percentage of fat is too low.

Sugar.—If the sugar percentage is too low the gain in weight is apt to be slow. Excess of sugar is shown by colic and thin acid motions, which cause irritation of the buttocks, and have a sour yeasty odour. Generally we have eructations of gas and a sour odour to the breath, with an excess of sugar in the food.

Holt summarises the most important indications as follows: "If not gaining in weight without special signs of indigestion, increase the proportions of all the ingredients; if habitual colic, diminish the proteids; for frequent vomiting soon after feeding, reduce the quantity; for the regurgitation of sour masses of food, reduce the fat, and sometimes also the proteids; for obstinate constipation, increase both fat and proteids."

Premature Infants.—The signal value of the exact modification of cow's milk as carried out by the laboratories is shown in the feeding of premature infants. Here the gastro-enteric tract is undeveloped and unfit to digest even human milk. I have had experience of a few successful cases of this kind where at the start the infant could only digest a food containing fat 1.50, sugar 3.00, proteid .25, of which a drachm every hour was administered. It is most satisfactory to see cases of this kind improve, and finally take and digest easily the mother's milk. I think that at the present time it is unwise to attempt any other form of feeding in the case of these premature infants.

Unhealthy and Feeble Infants.—The proper feeding of unhealthy and feeble infants, is one of the most trying and difficult undertakings. One is not infrequently called upon to superintend the feeding of an infant of five or six months of age, weighing scarcely more than at birth, with a digestive tract that has been struggling to nourish its

proprietor from all kinds of so-called infant foods, and has finally given up the attempt or refuses to retain anything committed to it. These are the most trying cases and require the greatest care and perseverance to ensure success. No gain in weight can be looked for till the digestion has improved. In the modification for these cases, as a rule the sugar is not at fault and need not be reduced below 4-4.50 per cent. It is the proteid that gives the most trouble, then the fats.

It is well to start these cases on a formula of about: Fat 2.00, sugar 6.00, proteid .60, and then gradually increase as the symptoms of indigestion pass away. In my experience, at first small quantities at short intervals, then larger quantities of the same formula at longer intervals, give the best results.

It is extraordinary in these cases what severe symptoms will follow the slightest excess of the element of the food at fault, thus the increase in percentages must be made with the greatest care and precaution.

Marasmus.—In the treatment of marasmus cases in children, of from 6 to 18 months, it is not infrequently the case that the fat must be kept low, while the proteid can be quite rapidly increased.

Diarrhœa.—In the treatment of summer diarrhœa the results of modified milk feeding are most satisfactory.

In a series of 115 cases treated under Dr. Rotch's direction last summer, five died, one was not improved and one hundred and nine recovered. The average age of the infants was 6.42 months. The milk was pasteurized in all cases ; the average number of feedings was 7.5, with an average amount of 4.5 ounces. The average percentages were : Fat, 2.6 ; sugar, 6.8 ; proteid, 1.2. The important point is to keep the percentage of fat as low as possible.

The chief objection to modified milk, as prepared by the laboratories, is the expense. But it is a rule of life that one cannot have a good thing without paying for it. The average expense is from $2.10 to $2.40 per week, which includes bottles and nipples, and cannot be considered excessive when the whole process is considered.

For some years I have, in feeding infants, rarely made use of anything but modified milk, and the more experience I gather the stronger is my faith in this scientific and accurate method.

Of course, in home modification one cannot hope to obtain any great degree of exactness, and, therefore, there is apt to be a greater proportion of failures.

Home Modification.—Home modification is inaccurate because it is impossible to procure a standard milk and cream. Rotch recently

had the cream from a reputable dairy tested on four successive days, with the result of a variation in the samples of from 10.13 to 28.34 per cent.

Then it is difficult to secure the care and attention to detail from the parents or nurse necessary to ensure success.

A safe milk cannot be obtained under ordinary circumstances in large cities. This difficulty cannot be overcome until the public has been trained to recognize the advantages of a pure milk supply, and is willing to pay a sufficiently high price for it to ensure the conscientious care necessary on the part of the producer.

The relationship between contaminated milk and the severe diarrhœas of infancy is too well known to be more than referred to.

Provided the milk is fresh when delivered, fairly accurate results may be obtained, in healthy cases especially, from home modification.

It has been my habit to depend upon a 12 per cent. and an 8 per cent. cream, diluted as required by a 6, 7 or 10 per cent. sugar of milk solution. With these, several of the most ordinary percentage food mixtures can be obtained.

I usually order the cream of the percentage desired from the laboratory, where it is pasteurized before delivery.

A 12 per cent. cream may be obtained by taking two parts of gravity or skimmed cream (16 per cent.) and diluting with one part of milk.

8 per cent. cream may be obtained by diluting one part of skimmed cream with two parts of milk.

The sugar solutions are obtained by adding sugar of milk to boiling water in the following proportions ;

A 10 per cent. solution by adding one ounce of sugar of milk to ten ounces of water.

A 7 per cent. solution by adding one ounce of the sugar to fourteen ounces of water.

A 6 per cent. solution by adding the same quantity of sugar to sixteen and a half ounces of water.

The alkalinity is secured by adding lime water or bicarb. of soda to the food as required.

Let us suppose, for example, that we wish to prescribe a food for a healthy infant of one month, of average weight. We would require ten feedings of two ounces each with the following percentages : Fat 3.00 ; sugar, 6.00 ; proteid, 1.00.

This is prepared each morning by diluting five ounces of a 12 per cent. cream with fifteen ounces of a filtered 7 per cent. sugar solution.

A half teaspoonful of soda bicarb. is added, and the food put on the ice and used as required.

The dilution here is one part of the cream to three of sugar solution. By adding two and a half parts of sugar solution to one part of the cream, one would have a food containing : Fat, 3.50 ; sugar, 6.00 ; proteid, 1.20, and so on.

If the physician is careful to give exact directions in writing any intelligent person can prepare the food.

As to results. In private practice, with healthy infants, I have seldom failed to obtain good results with home modification, where those in charge of the infant were intelligent and careful in the preparation of the food.

In the Montreal Foundling and Baby Hospital we have been using modified milk for the past eighteen months, with the most satisfactory results.

As we have become more familiar with the practical working of this method of feeding our results have improved. We have at present forty-four infants in the hospital, which is greatly overcrowded, and not one of them is the subject of marasmus.

Our mortality during the first four months of this year is half of what it was during the same period of last year.

The admissions so far this year were exactly double those of the same period last year.

We attribute our success in a great measure to this system of feeding. Most of the modification of food is done in the hospital by the nurse girls in training.

Recently, in order to test whether pasteurization of the food could be dispensed with, the infants were fed on unpasteurized milk. In a few days every infant so fed was suffering from indigestion and passing green motions with undigested curds. These troublesome symptoms disappeared entirely, without the use of drugs, on resuming the pasteurization.

The Walker-Gordon Co. report having put up prescriptions for over two thousand physicians with a mortality of $2\frac{1}{5}$ per cent. in healthy infants.

In closing I may be permitted to quote the recent utterances of two of the most eminent authorities :

Dr. Holt, of New York, says : " After two years' experience I have found the laboratory of great value in difficult cases of infant-feeding, and it soon becomes almost as much of a necessity to the physician practising among young children as does the apothecary shop to the general practitioner."

Dr. Rotch, in a paper read before the New York Academy of Medicine on April 3rd last, stated as follows : " I have never yet seen an infant who was carefully fed on milk during the first ten or twelve months of its life, by carefully changing the percentage of the milk constituents, and on nothing else, not enter on its second year with firm flesh and an average development. I have found the teeth to be sound, and to come at the usual age. I have found the functions of sitting, walking, standing, and the amyolytic functions all appear and develop normally. I have followed these children into their third, fourth and fifth years, and have found them strong, ruddy, with good bones and teeth, and with digestions which permit them to be fed on a general mixed diet of all the food elements."

STRANGULATED UMBILICAL HERNIA—OPERATION AND RECOVERY.

BY

R. E. Webster, M.D., C.M., Brockville, Ont.

As a successful operation for strangulated umbilical hernia occurring after the seventieth year is rare, the following case is of interest.

On the evening of May 12, 1897, I was called out of town to Mrs. P., a large fleshy woman, weighing about 200 lbs., aged 71 years, married, mother of seven children.

The patient was found to be suffering from an unreduced umbilical hernia, which had become strangulated about four hours previously. During this time she and her husband had been making unsuccessful attempts at reduction.

The patient gave a history of having had an umbilical hernia of twenty-five years standing, which had always been readily reducible until two years ago ; since which time she has had considerable difficulty in reducing it when it escaped, an accident occurring very frequently, on account of the difficulty in retaining it with a truss, because of the unusually fat abdomen.

The patient complained of a good deal of pain, and was vomiting at intervals of about ten minutes. Pulse 90. Temperature normal. Face anxious.

The large, fat abdomen was somewhat distended ; the tumor protruding about the size of a fœtal head.

The skin over the tumour was much discoloured from the prolonged attempts at reduction.

The patient was anæsthetized, and after repeated attempts at reduction, without success, was removed to the Brockville General Hospital, a distance of six miles, arriving there in fairly good condition. As the vomiting was more frequent and the pain more severe, immediate operation was decided upon.

Assisted by Drs. Macaulay and Harding, the patient was etherized at 2 a.m., the operation being performed by the aid of electric light.

An incision was made through the skin exposing the sac, which was much thickened.

On opening the sac, it was found to contain several ounces of fluid, about three feet of deeply congested small intestines, and about six inches square of omentum.

The ring (about one inch in diameter) so tightly constricted the mass that a hernia knife could not be inserted through it with safety.

The skin incision was extended downwards, and the ring opened from below, relieving the constriction.

The intestine, being in fairly good condition, was returned to the abdomen with some difficulty, being much distended with gas.

The omentum, being firmly adherent, was tied off in sections with catgut and removed.

The sac, which was very adherent to the ring and abdominal wall, was dissected out and cut off.

The ring was closed with silk, and the abdomen by three rows of sutures, in the usual way, the operation occupying forty-five minutes.

The patient suffered much from shock, but, rallying, made a gradual recovery, leaving the hospital at the end of seven weeks, in good condition.

At this date, August 26, 1897, patient is in good condition with a firm cicatrix, and shows no sign of any return of hernia.

RETROSPECT

OF

CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

The New Tuberculin.

BUSSENIUS. "Einge Mittheilungen über die bisher bei Anwendung des TR-Tuberculino, gesammelten, Erfahrungen."—*Deutsche Med. Wochenschrift*, July 8th, 1897.

SCHULTZE. "Kurze Mittheilung über das neue Kochische Tuberculin.' —*Deutsche Med. Wochenschrift*, July 8th, 1897.

The first named observer reports on 19 cases treated with the new tuberculin. Four cases presented lupus, twelve had tuberculous laryngitis, two tuberculosis of the lungs and one was a subject of asthma.

The largest number of injections in a single case was twenty-five, while the largest single injection given was 4 c. c.m., or 40 m.g., of the solid substance.

The patients were under treatment for a variable time, the longest time being 65 days, the shortest 29 days.

After these days were ended a period of quietness, *i. e.*, without treatment, was allowed to elapse and then the old preparation of tuberculin was used, but in all cases (19) no reaction was produced. It is the aim in administering tuberculin to avoid all reactions both local and general and so to increase the dose until immunity is induced. Bussenius found only four in whom the larger doses failed to produce a reaction. In the use of this new remedy every precaution was taken against infection and in the course of the writer's observations no untoward events were detected.

As to beneficial changes in the tuberculous areas themselves the following summarizes his remarks:

In the pulmonary cases no changes in the infiltrated areas could be

established. The ulceration on the pharynx and larynx of cases so treated showed tendency to cicatrize but without the formation of redness and the reaction œdema previously described.

Whether this treatment has special advantages in such cases the author says he is not in a position to decide.

The cases of lupus showed decided local reaction.

Schultze of Bonn, reports the use of this agent in 9 cases.

Concerning two of the cases beneficial results cannot be recorded. In four others no changes were noticed. In another case one of dry pleurisy, improvement was noticed during treatment.

In the remaining two treated in the out-patient department good results are assigned to the tuberculin.

SIEGMUND WERNER. "Beiträge Zur Pathologie des Ikterus Syphiliticus."—*Münchner Medicinische Wochenschrift*, No. 27, 1897.

Dr. Werner has recently written upon this subject reviewing the literature upon the same and arranging the various views as to the pathological conditions believed to be at the bottom of such cases.

The cases during a period of nineteen years at the St. George Hospital in Hamburg, numbered 15,799 and Dr. Werner's review of them shows icterus reported 57 times in early syphilis. Thus only .37 per cent. of all cases presented this sign.

He states that the following points may characterize the jaundice of syphilis, viz.:

1. It usually occurs early, *i. e.*, in secondary stage of syphilis.
2. It may be simultaneous with the occurrence of fresh specific manifestations.
3. It is influenced by the antiluetic treatment.
4. It may occur suddenly without premonitory or accompanying gastric disturbances.

Again, as a result of his review of observations made in these cases it would appear that the previous rate of occurrence per centum is too high, having formerly been reckoned at 1.4 per cent.

Jaundice of syphilis occurs more frequently in women than in men and in about three-quarters of the cases it is coincident with the first eruption or its first recurrence. Rarely does it occur later.

The intensity of the icterus is variable. Pruritus is rare. In the majority of the cases the intensity of the jaundice increases with the beginning of the use of mercury and shortly after rapidly diminishes. The duration of the colour varied from 14 days to eight weeks.

Syphilis with icterus was noted generally of a severe type, the attacks of eruption following each other in rapid succession. The

various theories concerning the pathogenesis of syphilitic icterus in the early stage are briefly presented.

1. Compression icterus, due to pressure of enlarged glands in the portal fissure.

2. Icterus, due to the presence of papules in the intestinal tract, analogous to the eruption on the skin.

3. Icterus, due to an inflammatory process in the liver. In such a process hyperæmia of the bile ducts and epithelial desquammation hinder the out-flow of bile.

4. Icterus, due to intestinal inflammation acting as intestinal catarrh in ordinary cases.

5. Icterus due to changes of syphilitic nature in the vessel walls.

6. Then there is the chemico-toxic theory. A catarrhal condition similar to that due to phosphorus, lead, etc., being induced by the syphilitic toxines.

7, Then again it is claimed that by syphilis the normal function of the liver cells is disturbed and this results in jaundice.

W. F. Hamilton.

Reviews and Notices of Books.

International Clinics: A Quarterly of Clinical Lectures on Medicine, Neurology, Surgery, Gynæcology, Obstetrics, Ophthalmology, Laryngology, Pharyngology, Rhinology, Otology and Dermatology, and specially prepared article on treatment. By professors and lecturers in the leading medical colleges of the United States, Germany, Austria, France, Great Britain and Canada. Edited by Judson Daland, M.D., Philadelphia, Instructor in Clinical Medicine and Lecturer on Physical Diagnosis in the University of Pennsylvania, Assistant Physician to the Hospital of the University of Pennsylvania, Professor of Diseases of the Chest in the Philadelphia Polyclinic, Fellow of the College of Physicians, Philadelphia; J. Mitchell Bruce, M.D., F.R.C.P., London, England, Physician to and Lecturer on the Principles of Medicine in the Charing Cross Hospital; David W. Finley, M.D., F.R.C.P., Aberdeen, Scotland, Professor of the Practice of Medicine in the University of Aberdeen, Physician to and Lecturer on Clinical Medicine in the Aberdeen Royal Infirmary, Consulting Physician to the Royal Hospital for Diseases of the Chest, London. Volumes I. and II. Seventh series, 1897. Philadelphia: J. B. Lippincott Company. 1897.

These volumes are neatly gotten up and the illustrations are good. As implied by the title, they contain a collection of clinical lectures, many of them being of considerable merit.

In volume I. the first lecture is on the Rules Governing the Treatment of Appendicitis, by J. William White, M.D., Professor of Clinical Surgery in the University of Pennsylvania. It is a careful, conservative presentation of the subject and is itself probably worth the price of the volume. A lecture by W. W. Keen, on Literary Method in Medicine, should be read and its precepts followed by every practising physician and surgeon. Other noticeable articles are the Treatment of Psoriasis, by Cantrell; Tuberculosis of the Larynx and Its Treatment, by Hoch; the Treatment of Pneumonia, by Cecil, and many other articles of interest.

Volume II. opens with an article on the Treatment of Presbyopia, by Jackson, and this is followed by a valuable lecture on the Treatment of Puerperal Eclampsia, by Herman, Senior Obstetric Physician to the London Hospital. The subject is dealt with in an eminently practical manner, bleeding, emetics, purgation, chloroform, morphine, chloral, pilocarpine and baths being discussed and the indication for their use indicated. Then follow articles on Fracture of the Tibia and Fibula, with remarks upon the use of splints and plaster of paris, by Roberts; Septic

Wounds and their Treatment, by Maylard; the Treatment of Chronic purulent Otitis Media, by Burnett, etc., etc. The above titles are mentioned simply to show the general character of the work. The material is gathered from a wide field, and the two volumes contain a great many interesting and instructive clinical lectures.

The Roller Bandage, with a Chapter on Surgical Dressing. By William Barton Hopkins, Surgeon to the Philadelphia Hospital. Fourth edition. Philadelphia: J. B. Lippincott Company. Montreal: Chas. Roberts.

The design of the writer is to teach bandaging more by the illustrations than by the descriptions thereof and in this way make the book as concise as possible. The book opens with a definition of what a roller bandage is and of the material of which it may be made. It would be well if the directions for cutting bandages were more explicit, for it is exceedingly difficult to cut a bandage straight, unless a thread is first drawn. Full directions are given how to roll a bandage and how to estimate the tension with which one should be applied; then the special bandages are taken up, beginning with the head and ending with the lower extremities.

The work ends with a chapter on surgical dressings, their preparation and sterilization. In the preparation of plaster of paris bandages no information is given as to the kind of crinoline to be used, and on this the success of the dressing very largely depends, for should it contain too much starch, the dressing dries too slowly, and should it contain none at all, it is difficult to apply it before it hardens.

The book is short aud yet contains all the essentials of bandaging. The system pursued makes it exceedingly easy for reference and the illustrations, being drawings from photographs, instead of reproductions of photographs, serve the purpose for which they are intended exceedingly well. It will without doubt prove a very useful book to both students and nurses.

Society Proceedings.

THE CANADIAN MEDICAL ASSOCIATION.

The Thirtieth Annual Meeting of this Association was held in Montreal on August 30th and 31st, 1897. Dr. V. H. Moore, Brockville, presided, and the sessions were well attended by members from all parts of Canada. The President was accompanied on the platform by the Retiring President, Dr. James Thorburn, of Toronto ; the General Secretary, Dr. F. N. G. Starr, of Toronto ; Dr. Roddick and Dr. J. M. Beausoleil, of Montreal ; Dr. Wm. Osler, of Baltimore ; Dr. J. E. Graham, of Toronto ; Dr. Wm. Bayard, of St. John ; Dr. T. T. S. Harrison, of Selkirk ; Dr. J. J. Bray, of Chatham, the Past Presidents of the Association, as well as a number of representatives from the United States.

Dr. James Thorburn, the Retiring President, briefly addressed the meeting and introduced his successor, Dr. V. H. Moore. Dr. Roddick, Chairman of the Local Committee, extended a cordial welcome to the visitors. He was followed by Dr. Moore, who delivered the Presidential address which we published last month. A vote of thanks to the President for his able address was proposed by Dr. Bray, of Chatham, and seconded by Dr. Beausoleil, of Montreal.

This was carried unanimously.

Several new members were elected and then the nominating Committee was balloted for and the following were elected : Drs. Bell, Marsil, Stewart, Beausoleil and Parke, Quebec ; Cameron, Graham and Shaw, Ontario ; Muir and McKeen, Nova Scotia . Walker and Coulthard, New Brunswick ; McLeod, Prince Edward Island ; Thornton, Manitoba ; Tunstell, British Columbia ; Dr. McKeen tied with Dr. Garrett for the last place, and was elected by the casting vote of the President, who gave it " in favour of Nova Scotia."

The question of Interprovincial Registration was now taken up. Dr. Walker, speaking on behalf of the Council of the Province of New Brunswick, said they had considered the following propositions which had been submitted to them by the committee appointed by the Canadian Medical Association last year, and had approved of them in their entirety :

" I. Matriculation—The schedule of subjects shall comprise : 1. English language, including grammar, composition and writing from dictation ; 2. arithmetic, including vulgar and decimal fractions, and

the extraction of the square root; 3. algebra, to the end of the simple equations ; 4, geometry, Euclid, books 1, 2 and 3, with easy deductions ; 5, Latin grammar, translation from specified authors, or of easy passages not taken from such authors ; 6, Elementary mechanics of solids and fluids, comprising the elements of statics, dynamics, hydrostatics and elementary chemistry ; 7, History of England and Canada, with questions in modern geography ; 8, and any one of the three following subjects : French, Greek and German, the requirements being the same as in Latin.

" Fifty per cent. of the marks in every subject shall be necessary for a pass, and 75 per cent. for honours.

" In lieu of the above will be accepted a degree in arts of any university in Her Majesty's dominions, or from any college or university that may hereafter be recognised, but no matriculation in arts in any university will be accepted.

II. Professional education—(a) The curriculum of professional studies shall begin after the passing of the matriculation examination, and shall comprise a graded course in the regulation branches of four yearly sessions of not less than eight months of actual attendance on lectures in each year. (b) The subjects to be anatomy, physiology, chemistry, pharmacy, surgery and clinical surgery, medicine and clinical medicine, including diseases of eye, ear, throat and nose, mental diseases, obstetrics, diseases of women and children, medical jurisprudence, toxicology, hygiene, pathology, including bacteriology.

" (c) That at least twenty-four months out of the graded four years, eight months each, be required for attendance on hospital practice, to begin with the second year of study. (d.) That proof of attendance on not less than six cases of obstetrics be required.

" III. Examination—All candidates for registration in the various provinces, in addition to having fulfilled the foregoing requirements, shall be required to undergo examination before examiners, to be appointed in each of the provinces by their respective councils, or by means of assessors, as in the province of Quebec, or by delegating their authority to one central body, as has been done in Manitoba. Such examination shall comprise all the subjects of professional study, shall be both written and oral, and 50 per cent. of the marks shall be required in every subject for a pass."

This announcement by Dr. Walker was received by loud applause. On Dr. Beausoleil making a similar statement for the Province of Quebec, the cheering broke out again.

Dr. PYNE, of Toronto, speaking for the Ontario Medical Council, stated that the question had not been specially discussed by them. In

their charter they had a clause providing for reciprocal registration with such provinces as should appoint a central examining board and exact a sufficiently high standard. From this stand they could not depart.

Dr. THORNTON, the President of the Manitoba Medical Council, regretted the position taken by Ontario. It implied that the question of Interprovincial Registration was no nearer to a solution than it had been at the meeting last year. The clause about Reciprocal Registration appeared in the Manitoba Act, but the matter had been carefully discussed by the Council and he had been instructed to state that they approved of the scheme as laid down by last year's Committee. The Manitoba doctors had gone to a great deal of trouble in the matter, and he felt that if some action was not taken this year, it would be some years before they could be induced to take it up again.

Dr. MCLEOD, of Charlottetown, said that Prince Edward Island had taken the same course as Manitoba and he had been sent as their representative to say that they approved of the scheme. They particularly desired that the matter should be pushed through at this meeting and definitely settled.

The meeting then adjourned until the following morning.

As soon as the President had taken the chair, Dr. Walker presented the following report from the Committee on Interprovincial Registration, and moved that it be adopted :

"The committee beg leave to report that the Medical Councils of Quebec, Prince Edward Island, Nova Scotia, New Brunswick and Manitoba have signified, by resolution, their approval of the resolutions of the committee of 1896, and have accepted them as a basis of agreement for interprovincial registration.

We, therefore, recommend that the matter be referred to the councils mentioned to formulate an agreement and to carry it into effect.

(Signed)

D. MARSIL,
C. S. PARKE,
H. CHOLETTE,
J. M. BEAUSOLEIL, Quebec.
G. E. COULTHARD,
THOMAS WALKER,
JAMES CHRISTIE, New Brunswick.
EDWARD FARRELL,
W. S. MUIR, Nova Scotia.
JAMES MCLEOD,
JAMES WARBURTON, Prince Edward Island.
R. S. THORNTON, Manitoba.

In the discussion which followed, it was stated that all the provinces except Ontario had accepted the proposed basis for reciprocity in registration. The representatives from Ontario stated that according to their charter they could not have interprovincial registration with a province which had not a central examining board, and that they did not wish to go to the legislature for fear that the Act should be repealed and the profession given no protection at all. It was pointed out that at the time that the Dominion was formed all the provinces had not come in. It was to be hoped that, as in the case of the provinces confederating so in this matter, that the other provinces would follow until finally all were in line.

The report was then adopted without any dissent.

The report of the nominating committee was then presented and was unanimously adopted.

President—Dr. J. M. Beausoleil, Montreal.

Vice-Presidents—Prince Edward Island, R. McNeill, Stanley Bridge ; Nova Scotia, R. A. McKeen, Glace Bay ; New Brunswick, P. R. Inches, St. John ; Quebec, C. S. Parke, Quebec ; Ontario, A. McPhedran, Toronto ; Manitoba, J. R. Jones, Winnipeg ; N.W.T., F. C. Mewburn, Lethbridge ; British Columbia, S. Tunstell, Vancouver.

Local secretaries—Prince Edward Island, P. McLaren ; Nova Scotia, James Ross, Halifax ; New Brunswick, H. Lunan, Campbellton ; Quebec, Dr. Marois, Quebec ; Ontario, Dr. Eclan, Ottawa ; Manitoba, W. J. Neilson, Winnipeg ; N.W.T., Geo. Macdonald, Calgary ; British Columbia, B. F. Boyce, Kelowa.

General Secretary—F. N. G. Starr, Toronto.

Treasurer—E. B. Small Ottawa.

Next place of meeting, Quebec.

It was moved by Dr. Reeve, seconded by Dr. McPhedran, that the ex-Presidents compose a committee on By-laws.

The auditors, Dr. Shaw, Hamilton, and Dr. Maeder, Halifax, then presented their report, which was unanimously adopted. It was a satisfaction to learn that the finances are in a flourishing condition.

The proceedings then closed with the usual votes of thanks.

Clinic at the Montreal General Hospital.

This was held in the Surgical Theatre on Monday, August 30th.

Dr. Blackader, while regretting that at this season of the year the beds in the medical side of the hospital were chiefly occupied by patients with typhoid fever, thought that perhaps a few words on the treatment of this everywhere prevalent disease might not be without interest to Members of the Association. For the past four years,

he said, almost all the patients in the hospital have been treated according to the Brand method. In accordance with this the patient, as soon as his temperature reaches 102½, is placed in a bath of a temperature of 80° F. which is rapidly cooled down to 70 or 68° F. While lying in the bath friction is applied to the limbs and cold to the head; the patient remains in the bath from 10 to 15 minutes. Should the bath be followed by any appearance of cyanosis, and reaction be slow, the patient is given a small quantity of stimulant either before or after the bath; the baths are repeated every three hours if necessary. Should the case appear to demand it, stimulants are given in moderation, from four to eight ounces of spirits daily, while strychnine and digatalis are used as occasion may require. Under this plan, the extreme typhoid state with muttering delirium, and subsultus tendinum that used to be met with under the old plan of treatment is now rarely seen. In the few extreme cases in which delirium sets in with much vaso-motor depression, a small dose of hyoscine hydrobromate will frequently be found to secure sleep. Out of 93 cases treated in the hospital last summer there were seven deaths, three of which were due to perforation. During the present year 54 cases have been treated with four deaths, two of which were due to perforation. This percentage is a decided improvement on the former record of this hospital. In closing his remarks on the treatment of typhoid fever, Dr. Blackader referred to the brilliant record which appears in the Annual Report of the Royal Victoria Hospital.

In this Hospital during the year 1896, 62 cases of typhoid were admitted; of these 60 were treated to a conclusion without one death; two were removed to their homes before complete convalescence, but both of these made a satisfactory recovery. Of these 62 cases many were of a grave type. This is a record of which the medical profession everywhere may justly be proud.

Dr. Blackader then showed three cases of cerebral hæmorrhage in children, all of them of the acute acquired type. He said that he had hoped to have present two or three other children illustrating the more common form of palsy met with in children, namely that occurring at birth. A third form is sometimes seen, truly congenital and due to defect in development. The etiology of birth palsy is sufficiently evident, being due to undue pressure causing rupture of some of the small meningeal vessels and hæmorrhage. The etiology of the acute acquired cases is more obscure. The onset is generally associated with an attack of convulsions and it has been a matter of discussion whether these convulsions should be regarded as the existing cause or as a mere symptom. As a fact these cases are frequently

met with as a sequela to many of the acute infectious diseases. The reason for this sequence is not exactly known but has been attributed to a fatty degeneration of the cerebral arteries due directly to the action in the blood of the specific toxines of these diseases. In those cases where the patient has been much debilitated by severe illness, the formation of a thrombosis in the superior longitudinal sinus may also favour the production of hæmorrhage. Strumpell on the other hand believes that many of these cases are due to an acute polio-encephalitis, an affection closely resembling the more common acute polio-myelitis.

In case No. 1, we have an instance of a severe cerebral hæmorrhage occurring in a child of four years. In the history of the patient, we note that he was supposed to have suffered from scarlet fever one year ago and from a subsequent nephritis. From them he apparently quite recovered as the urine shows no trace of disease. Before the hæmorrhage occurred he is described as a bright intelligent child of a fair size for his age and able to speak fairly distinctly.

At the beginning of this year the parents state that he appeared to suffer from headache and his nights were restless. He had two slight convulsive attacks previous to the one that ended so disastrously; this took place six weeks ago, lasted three hours and was only relieved by chloroform. The child remained unconscious for over a week, simply swallowing a little nourishment when placed on the tongue. As the child recovered, complete paralysis on the right side was noticed. He was brought to the hospital three weeks ago.

It is noted that the child was fairly well nourished but anæmic, was of good muscular development, that he was unable to speak, and appeared to understand little that was said to him, although he appeared to take an interest in all that was going on about him: There was distinct evidence of right-sided paralysis of the muscles of the face The right arm was motionless, the forearm flexed upon the arm in a position of pronation, the hand flexed at the wrist, the fingers bent into the palm of the hand, the thumb alone in a position of extension and adduction. The right leg lies motionless and semi-flexed with the foot partially extended. The right patellar reflex is exaggerated but there is no ankle clonus. The pupils are equal and react normally. Sensation so far as can be ascertained is unimpaired; there is no incontinence of urine. The respiratory and vascular systems show nothing abnormal. The notable point in his case is the aphasia. In adults this is almost invariably met with in connection with paralysis on the right side, but in children it is occasionally met with also in left hemiplegia. Of much importance in these

cases are the rigidities or contractures which regularly accompany the paralysis ; they occur early and are developed much more easily than in the cerebral palsies of adult life. The prognosis in a severe case like this should be most guarded, if signs of improvement set in in a few weeks, we may be somewhat hopeful, but if weeks and months pass, the probability for improvement becomes lessened. While we have in these cases little or no atrophy of the muscles except what may be accounted for by disuse, the affected limb generally remains stunted, and later on athetoid movements may develop. In many of these cases also, epilepsy forms an important sequence. The mental condition is also a source of anxiety ; in from 30 to 50 per cent. of cases distinct signs of mental impairment are noticeable. Frequently symptoms of secondary degeneration make their appearance in the portions of the brain surrounding the lesion. With regard to treatment there is little to be said ; of most importance is the care of the contractures which require the application of splints to prevent deformity.

In the second case we have an instance of hemiplegia due to embolism and associated with rheumatic endocarditis. The age of this patient is 10 years. We note that he had an attack of scarlet fever at six years of age, followed by acute rheumatism with involvement of the heart. Towards the end of last June he was taken ill with what was said to have been acute rheumatism. After 15 days illness he was seized suddenly in the early morning with clonic contractions of the left side of the body. On their subsidence paralysis of the left side was noted. At present he is a bright looking lad of fair intelligence with a slight paretic condition of the left side of the face, and marked loss of power in the left upper and lower extremity. There is some contracture of the fingers of the left hand, the reflexes on left side are distinctly increased, and patellar clonus may be elicited on this side. Tactile sensation is apparently normal on both sides as is also the sensation of heat and cold ; the respiratory system is normal ; a loud blowing systolic murmur is heard at the apex of the heart which is palpable $3\frac{3}{4}$ inches to the left of the left margin of the sternum.

The third case, for which I am indebted to the kindness of Dr. Stewart of the Royal Victoria Hospital, is one of monoplegia in a child of seven years. Originally a hemiplegia, the paralysis has passed away so far as the lower limb is concerned, and the upper limb alone remains affected. This is the usual course of events.

Dr. FINLEY presented a case of chronic lead poisoning in which paralysis of the muscles supplied by the external popliteal nerve was

present, although the extensors of the wrist and the small hand muscles were free. The patient was a man of about 30, employed in a rubber factory. Paralysis was noted about a year previously. Colic had been present but never severe. On first coming under observation there had been a well-marked lead line on the gums. There was double foot drop, steppage gait, atrophy and paralysis of the muscles of the lower leg. Both the faradic and galvanic irritability of muscles and nerves were lost.

Attention was drawn to the rarity of paralysis of the legs without involvement of the arms in the adult, although such a distribution was the rule in children.

Dr. FINLEY also showed a case of myopathic muscular atrophy. The patient, a male, æt 30, had noted weakness and pains in the muscles of the shoulder and thighs, beginning about five years previously. No other case of muscular atrophy was known in the family.

The spinati, deltoid, serratus magnus, pectoralis major and triceps showed a high degree of atrophy, also the buttock and quadriceps extensor of the legs. The abdomen was protuberant from weakness of the abdominal muscles. There was no fibrillary twitching and the face was free. The muscles responded to galvanism and faradism.

The type corresponded with Erb's juvenile form.

Dr. G. GORDON CAMPBELL brought forward a case of sporadic cretinism in a little girl, 3 years of age.

Dr. KIRKPATRICK showed a young woman on whom he had operated for perforated gastric ulcer last March. The operation had been performed four hours after the rupture had occurred. A median incision was made and the site of the rupture was found, without much difficulty, on the anterior wall of the stomach, four inches from the cardiac orifice and nearer to the lesser than the greater curvature. The opening was closed by a double layer of Lembert sutures, the peritoneal cavity cleaned by sponging with gauze pads, and the abdomen closed, a rubber drain being inserted down to the site of the perforation. A small opening was made just above the pubes and a glass drain inserted into the pelvis. A culture from the fluid in the peritoneal cavity proved sterile. The rubber drain was removed in twelve and the glass drain in twenty-four hours. Stomach feeding was commenced in twenty-four hours by giving small quantities of milk and lime water every hour. The patient was discharged in thirty-five days, quite well.

The diagnosis of perforated gastric ulcer had been based on the suddenness and severity of the attack, the abdominal tenderness with

the point of greatest intensity over the stomach, and a somewhat indefinite history of gastric disturbance and failing health.

Dr. SHEPHERD showed the following cases :

I. Colotomy after Maydl's method performed on a woman five years before for extensive syphilitic stricture of the rectum ; patient was in good health, but had several fistulæ about the artificial anus.

II. Case of excision of the lower jaw in a man aged 60, for carcinoma ; operation performed July 23rd. Dr. Shepherd stated that in all his cases of operations on mouth, jaws, neck and head, it was his endeavour to get the patient up as soon as possible, usually the day after operation ; he also in summer made them go out into the sunshine.

III. Case of excision of right upper maxilla in a woman aged 65 ; operation performed last February, no sign of recurrence.

IV. Cystic tumour of frontal sinus and orbit. A large opening could be felt in the frontal bone and communicated fluctuations between the orbit and projection on forehead ; the eye was displaced downward. Tumour first noticed 18 months before but she says her eye has been slightly displaced for 5 or 6 years. When admitted the cyst was tapped and a dark coloured fluid evacuated, the tumour disappeared but the eye remained the same, three fingers could be inserted in the opening in the frontal bone. The cyst rapidly refilled.

V. Dislocation of knee in a man aged 58. The displacement had been outwards and backwards and was due to the kick of a steer whilst loading cattle on a steamship ; the displacement was easily reduced and now he was able to walk about.

VI. A case of complete excision of thyroid gland, for large growth ; patient, a woman æt 50, was operated on in June, and was dismissed, cured ten days later ; the whole gland was removed because it was in a state of general cystic degeneration and no part of it could be left. Patient recovered rapidly, and as yet had developed no signs of myxœdema, perhaps there was a para-thyroid.

VII. Bullet wound of head. This was a case of attempted murder where the bullet entered the mastoid process, passed through part of temporal bone and, severing the facial nerve in the aquaductus Fallopii, and passing behind the styloid process and between the external and internal carotid, entered the mouth and knocked out a molar on the opposite side. An attempt was made to unite the ends of the nerve but there was so much destruction that the proximal ends could not be reached in the bone. This man also had a bullet wound through the chest, received at the same time.

VIII. A man aged 28, from whom had been removed last January

eight feet of small intestine and a large mesenteric tumour weighing 13 lbs. The patient when exhibited was in robust health and attending to his business as usual. The bowel had been united by primary suture. The tumour and removed intestines were also exhibited. Dr. Shepherd remarked that this was the second longest piece of intestine removed with recovery of the patient, and the longest ever successfully removed with a tumour.

Dr. G. E. ARMSTRONG showed a man aged about fifty years upon whom he had operated for cancer of the rectum situated high up. The operation was performed 18 months before. At the time the man was weak, thin and very anæmic. The disease was high up and involved the mucous membrane on the anterior wall of the rectum as well as the posterior.

The method of Heinecke was adopted, *i, e.*, osteo-plastic flaps were raised. The sacrum and coccyx were divided in the median line up to the level of the third sacral foraminæ and then transversely. When they were reflected perfect access was obtained. A sound was introduced through the urethra to facilitate the removal of the growth from the region of the prostate. When this was accomplished, the peritoneum was incised and the rectum carefully separated and drawn down as far as thought necessary, care being taken not to divide any of the meso-rectal vessels above the point selected for the division of the gut. The peritoneum was then carefully stitched to the anterior wall of the rectum and the peritoneal cavity closed before the gut was divided. In this case Dr. Armstrong had performed a left inguinal colotomy two weeks prior to the resection of the rectum. The wound being free from fæces healed kindly, and the man is now in very good health and quite active. There is no sign of recurrence.

Dr. ARMSTRONG also showed a little girl aged 14 years, upon whom he had operated for appendicitis in the acute stage. Ten days after the first operation, a tender, painful mass developed to the left of the incision. This complication was accompanied by rise of temperature. An incision was made over this mass and a small abscess found in the stump of the mesentery. The mesentery at the time of the first operation was found forming part of the abscess wall and all the apparently infected portion had been tied off. Evidently some infected corner had escaped and given rise to the secondary abscess. Second operations are as a rule unsatisfactory but this is an exception, as you see the girl is now quite well.

Dr. HUTCHISON showed first a compound fracture of the jaw, in which the bone had been broken in two places. By means of an interdental splint, fitted by Dr. J. S. Ibbotson, an excellent result had

been obtained. A case of talipes varus came next, in which excision of the astragalus had remedied the deformity. A successful operation for ununited fracture of the femur, in which the first operation had failed owing to the wire breaking, was then exhibited.

An interesting case of keloids on the chest and arm was viewed with interest, as was also a child, two and a half years of age, on whom a successful operation for appendicitis had been performed.

Cases exhibited by Dr. C. W. Wilson:

I. Annie M., æt 17, case of acute, painful flat foot, three months duration, rapidly becoming worse, deformity increasing; characteristic symptoms, tracings and carbon impressions shown. Treatment; twisting the feet up into extreme inversion and dorsal flexion, encasing in this position in plaster of paris. This requires an anæsthetic usually. After two weeks, removing the plaster of paris case and casts of the feet then made by Whitman's method, cast reproduced in iron, and the steel plate hammered upon it, and cut in the later Whitman shape, applied to the feet and inserted into the boots. This was done ten days ago. The patient was discharged three days after application and now walks as nearly perfectly as possible, with no pain, nor inconvenience. It is to be expected that the foot will be a little weak after coming out of the plaster, but the rest in the corrected position effects complete (or nearly so) resolution of the inflamed joint surfaces and peri-arthritic tissues, this inflammation being due to traumatism or mechanical injury, from joint surfaces not being in their proper relation, and stretching of ligaments and soft parts, also from the deformity.

II. Robert M., æt 52, chronic persistent flat foot, marked deformity. Abduction of oscalcis 45°, and marked eversion of both feet, tracings and carbon prints shown; pain, swelling and great tenderness. This case has been stretched and put up in plaster, the adhesions tearing like the breaking of a bundle of fagots, the feet over-corrected, left for three weeks, taken down and casts made. I usually apply the old cut down cases, after making the casts, and exercise the foot twice a day in all directions to tone up the muscles while waiting for the plates. These have in this short time relapsed to the extent you see, and I shall make an angle arm from this plate, and a leg upright with calf bands to control this foot, of course providing a joint at the ankle, and the elevated arch to the plate as in the Whitman plate.

III. Blanche L., æt 12. Apparatus for extension in the line of deformity in hip joint disease. Bradford steel frame, with canvas coverings and inclined plane, adjustable, to be attached to it. Perineal bands and pads attached to an arm from the side bars, other ends to the head cross bar. Raise the diseased leg until the lordosis is oblit-

erated and fix incline at that point, put on traction by weight and pulley and you will find that the muscles will relax and it can be let down from one to two inches a day until the hip is again 180°. It provides also for the lifting of the child about without disturbance of its position. Can be carried out bodily and placed on chairs in the open air, etc.

IV. Eva C., æt 10. Similar hip joint disease, old standing. Marked deformity, 90° in Thomas' position (the only reliable method of measuring). On traction incline and frame two weeks, now down to 145°. The goniometer is used for indicating these angles.

V. Jemima L., æt 8. Bradford frame, with head extension and upright for spinal cases. Potts disease, etc., with traction from the hips, by pelvic band, above trochanters, laced on and side webbing with cross bar at the feet, and weight and pulley. This frame can also be carried about anywhere with the patient upon it, and the functions of bowels and bladder performed without disturbance of the patient. This child has had paraplegic symptoms, hence use of extension in recumbent dorsal position.

VI. Maria Mc., æt 9. One of those totally paraplegic cases. This child was treated in recumbent position for some six months. Had lost all control of bladder and bowels and was unable to move a muscle of the lower extremities, had increased knee jerk, and marked ankle clonus. Potassium Iodide was also given in large doses, 35 gr. t.i.d., and increased above that amount even. Rapidly improved, plaster of paris jacket and Sayer's jury-mast applied later. Discharged from hospital when walking well. Now "can outrun any child on the block" and has got quite fat and looks very well. Will remove jacket and head spring in six months probably. Her treatment will then extend over two years, and I expect perfect cure with smallest possible deformity.

The other children are not wearing any artificial support at present and are also in as good condition as this child. They were treated similarly, recumbency, plaster of paris jacket and corset.

The Smoking Concert.

This was held on Monday evening, in the Masonic Hall, and was a pronounced success. The programme was contributed by a number of well known amateurs and was a lengthy one. Among those who contributed were Drs. Max Lauterman, H. Robertson, Jehin Prume, Pelletier and Sheridan; Messrs. Wilkes, Parker, Rose, Hickey and Anderson.

A poem, written by Dr. W. H. Drummond for the occasion, and entitled "Ole Docteur Fiset," was read by Dr. C. W. Wilson, and was received with loud applause.

"OLE DOCTEUR FISET."

BY

W. H. Drummond, M.D.

Ole Docteur Fiset, of Saint Anicet,
Sapré tonnerre, he was leev' long tam !
I'm sure he's got ninety year or so
Beat all on de parish, 'cept Pierre Courteau,
An' day affer day he work all de sam' !

Dat house on the hill you can see it still,
She's same place he buil' de firse tam he come ;
Behin' it dere's one leetle small jardin ;
Got plaintee de bes' tabac Canayen,
Wit' fameuse apple and beeg blue plum.

An dey're all right dere, for de small boy's scare
No matter de apple look nice an' red,
For de small boy know if he's stealin' some
Den Docteur Fiset on dark night he come,
An' cut leetle feller right off hees head.

But w'en dey was rap, an' tak' off de cap,
M'sieu' le Docteur he will say "Entrez,"
Den all de boys pass on jardin behin',
W'ere dey eat mos' ev'ryting good dey fin'
Till dey can't go on school nearly two, t'ree day—

But Docteur Fiset, not moche fonne he get
Drivin' all over de whole contree,
If de road she's bad, if de road she's good,
W'en everyting's drown on the spring-tam' flood,
An' workin' for noting, half-tam, maybe.

Let her rain or snow, all he want to know
Is jus' if anywan's feelin' sick,
For Docteur Fiset's de ole fashion kin',
Doin' good was de only ting on hees min',
So he got no use for de politique.

An' he's careful, too, 'cause firse ting he do,
For fear dere was danger some fever case
Is tak' w'en he's come leetle w'isky chaud,
Den noder wan too, jus' before he go
He's so scare carry fever aroun' de place.

On nice summer day, w'en we're makin' hay,
Dere's not'ing more pleasant for us, I'm sure
Dan see de ole man come joggin' along,
Alway singin' some leetle song,
An' hear heem say, "Tiens, mes amis, Bonjour."

An' w'en de cole rain was commence again
An' we're sittin' at home on some warm cornerre
If we hear de buggy an' see de light
Tearin' along t'roo de black, black night,
We know right off dat's de ole Docteur ;

An' he's smart horse sure, w'at he call "Faubourg,"
Ev'ry place on de Parish he know dem all,
An, you ought to see de nice way he go
For fear he's upsettin' upon de snow,
W'en ole man's asleep on de Cariole ;

I 'member w'en poor Hormisdas Couture
Get sick on hees place twenty mile away,
An' hees boy Ovide he was come raquette,
W'at you call Snowshoe, for Docteur Fiset,
An' Docteur he start wit' hees horse an' sleigh.

All de night before, de beeg storm she roar.
An' mos' of de day, it's de sam' also
De drif' was pilin' up ten feet high,
You can't see not'ing dis side de sky,
Not'ing but wan avalanche of snow.

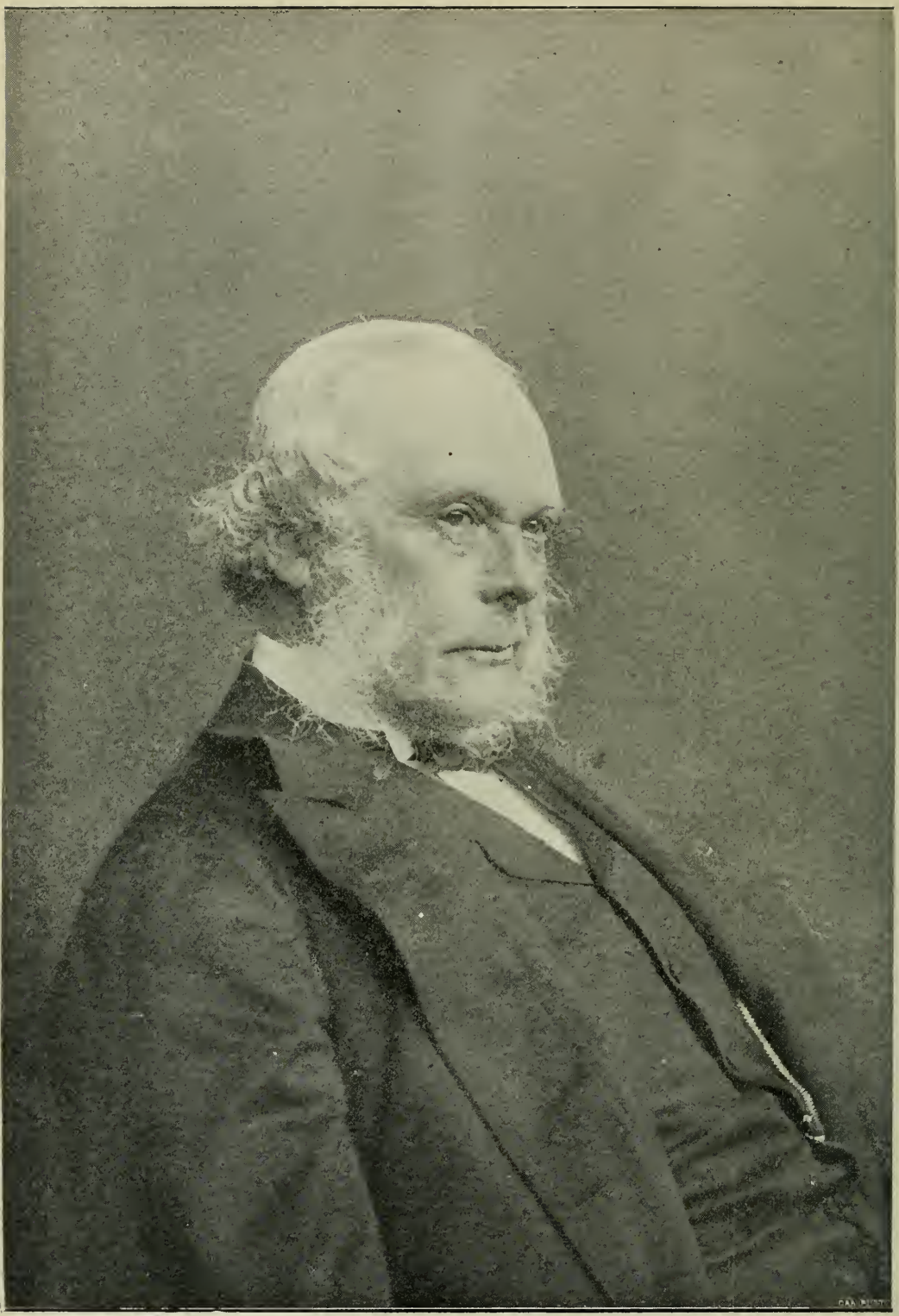
I'm hearin' de bell w'en I go on de well
For water de cattle on barn close by,
But I only ketch sight of hees cheval blanc,
An' hees coonskin coat wit' de capuchon,
An' de storm tak' heem off jus' de sam' he fly.

Mus' be le bon Dieu dat is help him t'roo
Ole Docteur Fiset an' his horse "Faubourg,"
'Twas someting for splain-me, wall, I don't care,
But somehow or 'noder he's gettin dere,
An' save de life Hormidas Couture !

But it's sam' alway, lak' dat ev'ry day,
He never was spare hese'f pour nous autres,
He don't mak' moche monee Docteur Fiset,
An' offen de only t'ing he was get
Is de prayer of poor man, an' wan bag of oat.

* * * * * * * *

Wall ; Docteur Fiset, of Saint Anicet,
He is not dead yet, an' I'm purty sure
If you're passin' dat place about ten year more,
You will see heem go roun' lak' he go before,
Wit' de ole cariole an' hees horse "Faubourg !"



LORD LISTER.

THE

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BRITISH MEDICAL ASSOCIATION.

The first colonial meeting of the British Medical Association is now a thing of the past, but its memory will long remain with those who took part in it. It has passed off with the greatest success possible and everyone has thoroughly enjoyed it. From the opening of the meeting with the church service in the Anglican Cathedral to the closing of the festivities with the reception at McGill University on Friday night, no hitch occurred, but everything passed off with the greatest pleasantness and unanimity. The preacher at the church service was the Rt. Rev. Dr. Dumoulin, Lord Bishop of Niagara, who took for his text "How God anointed Jesus of Nazareth with the Holy Ghost and with power: who went about doing good and healing all that were oppressed of the devil; for God was with Him."—Acts, 10th chapter and 38th verse. The opening sentences dealt with the notable gathering in London this year to take part in one of the most remarkable events in the history of the nation. He spoke at length of the medical profession, comparing its work only with that of the Church. It was a sermon that was listened to with rapt attention throughout. The offertory taken up afterwards was in aid of medical charities.

In the afternoon the opening ceremonies of the meeting took place in the Windsor Hall. The visitors were welcomed by the Mayor on behalf of the citizens of Montreal, by Sir Adolphe Chapleau, the Lieut.-Governor, as representing the Province of Quebec, and by His Excellency the Governor-General, on behalf of the Dominion. The chair at this meeting was taken by the President of the Council, Dr. Robt. Saundby, of Birmingham. He was supported by the officers of the Association. On the platform were also Lord Aberdeen, the

Governor-General of Canada, Sir Adolphe Chapleau, Lord Lister, Lord Strathcona and Mount Royal, and Mayor R. Wilson-Smith.

After the addresses of welcome, the delegates were introduced by Dr. Adami to the President and to the Governor-General.

Dr. O'Donnell said, before leaving Winnipeg he was commissioned by the Premier of Manitoba to invite the Association to hold their next year's meeting, or some meeting in the near future, in the city of Winnipeg. He was aware that, as this was the first meeting held outside the United Kingdom, the request might seem a little presumptuous. It was true that thirty years ago Winnipeg was only an outpost of civilization, but it was now a flourishing city of fifty thousand inhabitants, situated precisely in the centre of British North America and of the North American Continent.

Dr. Saundby thanked Dr. O'Donnell for the invitation, and said the Council in London would be very glad to take the matter into consideration.

Dr. Roddick, the President of the Association, then delivered his inaugural address (see page 161, September number).

In moving a vote of thanks to Dr. Roddick for his valuable and eloquent address, Lord Lister remarked that he could testify from personal experience to the value of one of the health resorts which had been referred to. He had spent three days in the Muskoka region, and never had he seen a more lovely country nor could he conceive of a more healthful district. He confirmed what Dr. Roddick had said regarding the progress which has been made in Canada in medical education and legislation. The question of medical legislation is an extremely difficult one, and he thought that the same system which prevailed in England would be found to work well in Canada.

Sir James Grant, of Ottawa, seconded the resolution in an eloquent and patriotic address, and it was carried by acclamation.

Dr. Saundby conveyed the thanks of the Association to the Governor-General, the Lieut.-Governor, and the Mayor for their presence. This terminated the first day's proceedings, the rest of the day being given up to the entertainment of the members. It would take too long to detail the arrangements which had been made with this end in view, suffice it to say that every moment of the week was kept fully occupied, either by the sectional work and the general addresses of the Association, or else by the garden parties and other entertainments tendered by the city and the citizens of Montreal.

A pleasing function was the dinner tendered to Lord Lister by the Montreal Medico-Chirurgical Society. This took place on the Tues-

day evening, and at a later hour there was a soiree at Laval University, at which Professor Chas. Richet delivered an address on the work of Pasteur and the modern conception of medicine.

The annual dinner of the Association took place on Thursday evening at the Windsor Hotel and was a distinct success, the number sitting down being considerably over 400.

The arrangements of the Excursion Sub-Committee formed one of the attractions, on the social side, which were much appreciated by the members of the Association and their guests. On Tuesday ten of the large open cars of the Montreal Street Railway were placed at the disposal of those who cared to see something of the city and its environs. Judging from the way the cars were filled up, this trip was a decided success.

On Wednesday and Friday, after the public meetings, special trains were provided to take members and guests to Lachine, where the steamer Sovereign, with a band on board, was waiting to take them down through the Lachine Rapids. About eleven hundred took in this trip, and one and all enjoyed its beauty. These excursions were given free.

The city and medical profession of Ottawa having extended an invitation to the members to visit Ottawa, the Executive decided to contribute towards the success of this trip by providing a special train made up of five chair cars and one Pullman. The run up was made in a little over two hours and a half. Arriving at the capital entertainment was provided in the shape of electric railway rides, a lacrosse match and a sumptuous luncheon at the Russell House. His Worship the Mayor of Ottawa honoured the guests by being present and succeeded in making every one feel quite at home. Other Saturday excursions were arranged for, one to Lake Saranac and one to Lake Memphremagog. The latter was not patronised to the extent that the attractions of the lake would seem to have merited.

The Annual Museum.

We will publish a full description of this in our next number.

JUBILEE NURSES' HOME.

Lord Lister at the Montreal General Hospital.

Thursday, September 2nd, 1897, was a red letter day in the history of the Montreal General Hospital, for on that day the foundation stone of the only Jubilee work in Montreal was laid by Lord Lister. As we noticed a short time ago, the Governors of the Society of the Montreal General Hospital had, on the strength of a report from the

President and Committee, decided to commence this work at once, and accordingly the ground was broken in the latter part of June. In order to add to the interest which already is manifested in this venerable institution, advantage was taken of the presence in the city of Lord Lister, who was asked and consented to lay the corner stone.

After Dr. Barclay had opened the proceedings with prayer, the President, Mr. F. Wolferstan Thomas, briefly sketched the progress of the hospital since its foundation in 1822. He was followed by His Excellency the Governor-General, who spoke upon the disinterested and noble character of the nursing profession. In conclusion he expressed his cordial good wishes for the success of the undertaking.

In laying the stone Lord Lister spoke of the great advantage which medical schools are to hospitals in stimulating the medical officers to a proper appreciation of the importance and nobility of their calling.

Lord Mount Royal briefly spoke on the benefits which hospitals conferred upon the public and paid a graceful tribute to the President of the institution in referring to the good work he had accomplished. Mayor Wilson-Smith extended congratulations upon the establishment of the Jubilee Nurses' Home. Dr. Roddick being called upon, made a few remarks on the progress which had been made in the profession of nursing in Canada. He called attention to the fact that the presence of Lord Lister on this occasion was very appropriate, because this hospital was the first in Canada in which the antiseptic principles, of which he was the author, were introduced.

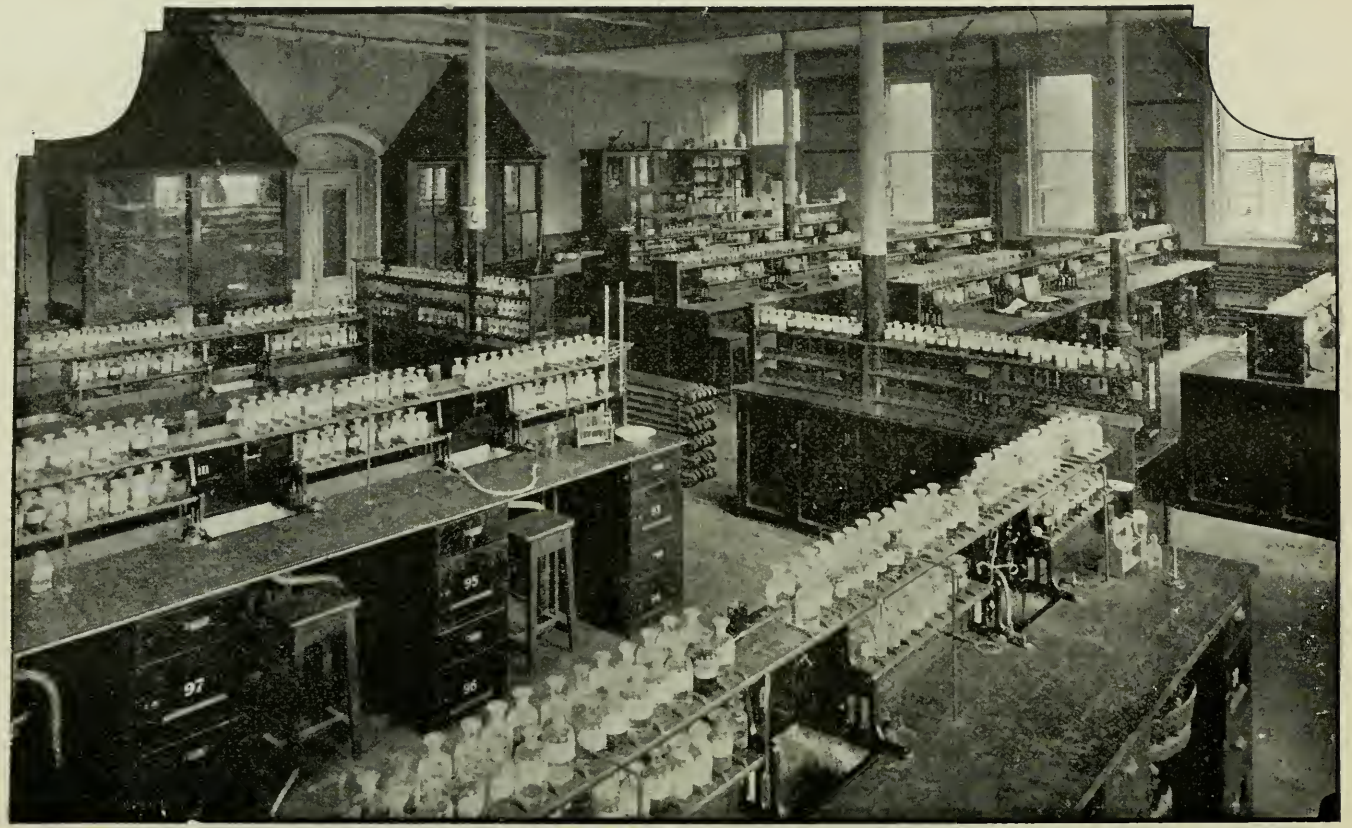
One of the features of the occasion was the singing of the National Anthem by the nurses, who, attired in their becoming pink and white uniforms, occupied a platform in front of the building. Cheers were given for Her Majesty, the Governor-General, Lord Lister, Lord Mount Royal and others. The proceedings were brought to a close by the Bishop of Niagara pronouncing the Benediction.

McGILL MEDICAL LIBRARY.

During the past year several important additions have been made to the Library. Complete files of Virchow's Archives, the Deutsches Archiv für Klinische Medicin, and of the Zeitschrift für Klinische Medicin, have been purchased, and additions have also been made to the English and American journals, so that now the library offers for Bibliographical purposes a wide field for research. Although the catalogue is not yet complete, it is estimated that there are at least 15,000 volumes exclusive of duplicates.

The undergraduates of McGill Medical Faculty have presented their

McGILL MEDICAL COLLEGE.



CHEMICAL LABORATORY, McGILL MEDICAL COLLEGE.

private library to the Library Committee, to form part of the Medical Library.

The thanks of the Faculty are due to Messrs. Henry Birks & Sons, for the gift of a handsome clock; also to Messrs. Henry Morgan & Co., for jardiniéres, and to Messrs. Tees & Co., for a revolving bookcase.

The number of volumes presented to the Library to June 31st, 1897, is 410
Those added by purchase 137

Total additions for the year 637

The total attendance, from June 2nd, 1896, to June 1st, 1897, has been 5,920
The attendance during the previous year was.... 4,875

DONATIONS TO THE MEDICAL LIBRARY.

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PRESENTED BY THE AUTHORS.

A. C. Abbott, M.D.—
Principles of Bacteriology, 1895.

D. Campbell Black, M.D., L.R.C.S., Ed.—
The Urine in Health and Disease and Urinary Analysis, 1895.

W. S. Colman, M.D., M.R.C.P.—
Section Cutting and Staining, 1896.

Carey Coombs, M.D.—
Galvanism in the Treatment of Neuritis and other Diseases, 1896.

Alexander Duncan, B.A., Lond.—
Memorials of the Faculty of Physicians and Surgeons of Glasgow, (1599-1850), 1896.

Max Einhorn, M.D.—
Diseases of the Stomach, 1896.

William Ewart, M.D., Cantab., F.R.C.P., Lond., M.R.C.S., Eng.—
Gout and Goutiness, 1896.

Ernest Finger, M.D.—
Die Syphilis und die Venerischen Krankheiten, 1896.

W. E. Fothergill, M.A., B.Sc., M.B., C.M.—
Manual of Midwifery, 1896.

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Royal Infirmary Cliniques, 1896.

M. L. Klein, M.D., Lond.—
Micro-organisms and Disease, 1896.

S. A. Knopf, M.D.—
Les Sanatoria Traitement et Prophylaxie de la Phtisie Pulmonaire, 1895.

J. H. Musser. M.D.—
Practical Treatise on Medical Diagnosis, 1896.

William Osler, M.D., F.R.C.P., Lond.—
Collected Reprints, 3rd Series (Jan. 1st, 1892, Jan. 1st, 1897).
Lectures on Angina Pectoris and Allied States, 1897.
Lectures on the Diagnosis of Abdominal Tumors, 1896.

Stephen Paget, M.A., Oxon.. F.R.C.S.—
The Surgery of the Chest, 1896.

Robert Reid Rentoul, M.D., L.R.C.P., Ed., M.R.C.S., Lond.—
The Causes and Treatment of Abortion, 1889.

Sir William Roberts, M.D., F.R.S.—
Digestion and Diet with an Appendix on the Opium Habit in India 1897.

G. E. de Schweinitz, A.M., M.D.—
The Toxic Amblyopias, 1896.

H. Scurfield, M.D., Ed., D.Ph., Camb.—
Animal Tuberculoses and their Relations to Human Tuberculosis translated from the French of Ed. Nocard, 1895.

James Startin, M.D.—
Pharmacopœia for Diseases of the Skin, 1896.

Robert Saundby, M.D., Ed.—
Lectures on Renal and Urinary Diseases, 2nd Edition, 1896.

John C. Thresh, D.Sc., Lond., Victoria, D.P.H., Camb.—
Water and Water Supplies, 1896.

Nestor Tirard, M.D.—
Diphtheria and Antitoxin, 1897.

Otto A. Wall, M.D., Ph.G.—
The Prescription : Therapeutically, Pharmaceutically, Gramaticall and Historically Considered, 1890.

J. C. Webster, B.A., M.D., F.R.C.P., Ed.—
Selected Papers, 1895.
Ectopic Pregnancy, 1895.
Practical and Operative Gynæcology, 1896.
Die Ektopische Schwangerschaft, 1896.

H. M. Whelpley, M.D., Ph.G., F.R., M.L.—
Therapeutic Terms for Pharmacists and Physicians, 1894.
Chemical Lecture Notes, 1895.

J. Burney Yeo, M.D., F.R.C.P.—
Food in Health and Disease, 1896.

H. H. Sir Bhagvat Sinh Jee, Thakore Saheb of Gondal—
A Short History of Aryan Medical Science, 1896.

The library is also indebted to the following contributors :

Professor Adami—
Sajous Annual.
Manchester Medical Chronicle, 8 vols.
Gazette des Hopitaux, 1896.
Medical Directory, Lond., 1890.

Professor Armstrong—
Boston Medical Journal, 1896.

Boston Medical Library—
Guy's Hospital Reports, Vols. 16, 25.

Professor Blackader—
Materia Medica, Therapeutics and Pharmacology, by G. F. Butler, M.D., 1896.
Materia Medica and Pharmacology, by D. M. R. Culbreth, M.D., 1896.
International Medical Magazine, 1896.
Archives of Pediatrics, 1896.
Transactions of the American Pediatric Society, 1895.

Bristol Medical Library=

6 vols. of Brain., 9 vols. of the Annals of Surgery.

British Medical Association Library—

100 vols.

Dr. Philip P. Burrows—

System of Operative Surgery, 2 vols., by J. Bell, 1807-9.
Principles of Surgery, 2 vols., by J. Bell, 1815.
Lectures on the Ventilation of Buildings, by H. Ruttan, 1848.
Medical Regulations, 1859.
Destructive Art of Healing, by Dickson, 1856.
Whole Works of Dr. A. Pitcairn, 1740.

Professor J. C. Cameron—

American Journal of Obstetrics, 1896.
Munchener Medicinische Wochenschrift, 1896.
Lehrbuch der Geburtshülffe, by M. Runge, M.D., 1894.
Therapeutique Obstetricale, by A. Auvard, M.D., 1893.
Pathology of Childbed, by F. Winckel, M.D., 1876.
Practical Treatise on Urinary and Renal Diseases, by W. Roberts, M.D., 1885.
Medical Diagnosis, by J. M. DaCosta, M.D., 1884.
Diseases of Women, Vol. I., by L. Tait, M.D., 1889.
Manual of Obstetrics, by Dr. Dorland, 1896.
Manual of Pathological History, Vol. I. and II., by Carnil and Ranvier, translated by A. M. Hart, M.D., 1882-84.
British Gynæcological Journal, Vols. X. and XI.
Odd Journals.
Three vols. Medical Congress.

College of Physicians Phil.—

2 vols.

Hon. F. A. Crandall—

Surgeon-General's Index, 3 vols.

Edinburg University—

1 vol.

Editors of the Montreal Medical Journal—

Archives of Clinical Skiagraphy.

Dr. D. J. Evans—

Archiv. für Kinderheilkunde, 17 Bd., 1894, 18 Bd., Nos. 1-2.

Professor F. G. Finley—

Fortschritte der Med. Bds. 94-95.
Transactions of the Medical Society of the State of New York, 1892.
International Clinics, Vol. III., 1893.
La Semaine Medical, 1896.
Handbuch der Speciellen Pathologie und Therapie, Bds. I. to VII.
Influenza, by E. S. Thompson, 1890.
St. Thomas Hospital Reports, 1890.

Dr. G. M. Gould—

University Medical Magazine, Vol. I.
Medical News and Abstract, Vols. 38-39.
Medical News. Phil., Vols. 18 to 30.

Glasgow University—

1 vol.

Dr. James Kerr—

Photomicrographs of Normal Histology, Human and Comparative, 3 volumes, 1893.

Dr. R. C. Kirkpatrick—

Annals of Surgery, 1896.
American Academy of Railway Surgeons, Vols. I. and II.
Bulletin Medical.
Observations on Human and Comparative Parturition, by R. Bland, M,D., 1794.
Journals.

Dr. F. Lamarche—

Union Médicale.

Mr. L. E. Lawlor—

A System of Human Anatomy, by H. Cloquet, M.D., 1830.

W. J. C. Miller, B.A.—

Medical Register, 1896.
Dentists' Register, 1896, Lond.

McGill's Graduates' Society—

12 vols.

McGill's Medical Society of Undergraduates—

Lancet 1896.
Therapeutic Gazette 1896.
Popular Science 1896.

Dr. W. S. Morrow—

Experimented Physiology, by Martin, Lond., 175

Dr. A. S. Myrtle—

Journal of Balneology and Climatology.

New York Academy of Medicine—

Fortschritte der Med. Bds., 3 & 4 Journals.

New York State Board of Health—

2 vols.

Dr. T. D. Reed—

Materia Medica, by J. B. Biddle, M. D., 1892.

Royal College of Physicians—

4 vols.

Royal College of Surgeons—

20 vols.

Saint Thomas Hospital—

Reports, 1897.

Professor Shepherd—

New York Medical Record, 1896.
Maritime Medical News, 1896.
Canadian Practitioner, 1896.
Cutaneous and Genito-Urinary Diseases, 1896.
Canada Medical Record, 1896.
University Medical Magazine, 1896.
La Tribune Médicale, 1896.
Transactions of the First Pan-American Medical Congress, 1895, 3 vols.
Archives of Pediatrics, 1896.
Canadian Record of Science.
Case Books of R. L. MacDonnell, M.D., and Richard MacDonnell, M.D.
Transactions of the American Orthopedic Association, Vol. IX., 1896.
The Diary of a Resurrectionist (1811-1812) by J. B. Bailey, B. A., 1896.
Der Lustige Æsculap, by Von.
Dr. Peter Hilarius.

Smithsonian Institution—
3 vols.

State Board of Health, California—
10 vols.

State Board of Health, Illinois—
7 vols.

State Board of Health, Michigan—
4 vols.

Transactions of the American Climatological Association—
12 vols., 1896.

Transactions of the American Electro-Therapeutic Association—
3 vols., 1893-94-95.

Transactions of the American Laryngological Association, 1896.

Transactions of the American Ophthalmolgical Association, 1896.

Transactions of the American Orthopedic Association, 1896.

Transactions of the American Association of American Physicians—
Vol. XI., 1896.

Transactions of the Clinical Society of London—
Vol. XXIX., 1896.

Transactions of the College of Physicians, Phil.—
12 vols.

Transactions of the Medical Society of the State of New York—
38 vols.

Transactions of the New York State Medical Association—
12 vols.

Transactions of the Ohio State Medical Association.

Transactions of the Philadelphia Pathological Society
14 vols.

University College, Bristol—
1 vol.

University College, London—
10 vols.

Westminister Hospital Reports—
9 vols.

C. W. Wilson—
Corporio Humani, by C. Bartholini, 1611.

DONATIONS FROM PUBLISHERS

American Medico-Surgical Bulletin.
Buffalo Medical Journal.
Chicago Medical Record.
Clinique, La.
Dominion Medical Monthly.
Journal of the American Public Health Association.
" " Boston Society of Medical Sciences.
Medical Bulletin.
" Times.
Montreal Medical Journal.
New York Medical Times
Pediatrics.
Philadelphia Polyclinic.
Post-Graduate.
St. Bartholomew's Hospital Journal

Sanitary Inspector.
Treatment.
Universal Medical Journal.
Virginia Medical.

Pamphlets have also been received from the following :

Dr. Craik, Dr. Shepherd, Dr. DeSchweinitz, Dr. S. Knapp, Dr. Mills, Dr. R. Mackenzie, Dr. Startin. J. C. Cameron, Smithsonian Institution, Royal College of Surgeons, Lond., Dr. Barker, Dr. Foucher, Dr. Black, Anderson's College Medical School, Dr. Kirkpatrick, Dr. Fletcher, U. S. Depart. of Agriculture, Dr. Rentoul, Dr. Finley, Manhattan Eye and Ear Hospital Report.

The following are the members and officers of the British Columbia Medical Council : Dr. R. E. McKechnie, President ; Dr. T. W. Lambert Vice-President ; Dr. C. J. Fagan, Registrar and Secretary ; Dr. John A. Duncan, Treasurer. Members : Drs. J. C. Davie, W. J. McGuigan, G. R. Milne. Solicitor : A. E. McPhillips.

We have received the September number of *The Canadian Journal of Medicine and Surgery*, and are glad to note the excellent account of the meeting of the British Medical Association. It is illustrated by cuts of the principal officers of the Association and of some of the medical buildings of Toronto and Montreal.

Arrangements are now completed for the meeting of the Mississippi Valley Association at Louisville on October 5, 6, 7 and 8, 1897. The different passenger associations have granted a round-trip rate of one and one-third fare on the certificate plan. The sessions will be held at the Liederkranz Hall, and the headquarters will be at the Louisville Hotel. A long list of papers is announced.

The fourth annual meeting of the American Academy of Railway Surgeons will be held in the Auditorium, at Chicago, Ill., on Wednesday, Thursday and Friday, October 6, 7 and 8, 1897. The following are the officers of the Association for the year 1896-1897 : President, L. E. Lemen, M.D. Division Surgeon U. P. Railway, Denver, Col. ; First Vice-President, M. Gardner, M.D., Chief Surgeon S. P. Railway, San Francisco, Cal. ; Second Vice-President, Ricardo Ortega, M.D., Chief Surgeon Mexican International Railway, Cindad Porfirio Diaz, Mexico ; Secretary, D. C. Bryant, M.D., Oculist U. P. Railway, Omaha, Neb. ; Treasurer, C. B. Kibler, M.D., Surgeon Erie Railway, Corry. Pa. ; Editor, R. Harvey Reed, M.D., Chief Surgeon C. S. & H. R. R, Co., Columbus, Ohio.

THE

MONTREAL MEDICAL JOURNAL.

VOL. XXVI. NOVEMBER, 1897. No. 5.

Original Communications.

A DISCUSSION ON THE TREATMENT OF INSOMNIA.

I.—C. K. CLARKE, M.D.

Medical Superintendent Rockwood Hospital, Kingston; Professor Mental Diseases, Queen's University.

The term insomnia includes such a variety of disorders of sleep that it is difficult to cover the general question of treatment in a brief paper. Possibly the only fair way to approach the subject is by first considering the physiology of sleep, as without this, all treatment is apt to become empirical, and indeed much of the routine treatment by drugs in the past has been open to this objection, and even to-day we cannot say that we understand the complex physiology of sleep as we hope to understand it later on. At the same time something has been done, and we can fairly claim that in some of the disorders of sleep we have rational treatment, quite in harmony with the most recent physiological discoveries.

The majority of physiological writers seem to agree that during normal sleep there is vascular dilatation of the skin, as a result of which there is a fall of blood pressure in the arteries at the base of the brain, and a lessened blood supply in the cortex. Elaborate theories have been propounded to account for this condition in which the vasomotor centre controlling the vessels of the skin plays such an important part.

Howell, of Johns Hopkins, has been one of the most recent to advance a new theory, and in the *Journal of Experimental Medicine*, Vol. II., No. 3, 1897, says: "This condition of anæmia, in connection with the withdrawal of external stimuli, causes a depression of the psychical processes in the brain cells, below the threshold of consciousness. The fall of blood pressure is due, in the first place, to a relaxation of tone in that portion of the vasomotor centre controlling

the skin vessels. The immediate cause of normal awaking, on the contrary, is found in the augmented flow of blood to the brain that follows upon the gradual constriction of the skin vessels as the vasomotor centre recovers its tone. The periodicity of sleep is therefore directly connected with a rhythmic loss and resumption of tone in the vasomotor centre, etc.

"Throughout the waking period the vasomotor centre is under continual stimulation, and is therefore in continual activity. Sensory impulses, especially from the skin and the cutaneous sense organs, are at all times falling into the central nervous system in greater or less quantities, and through a reflex pressor action on the vasomotor centre these sensory impulses keep up a constant activity of the centre, particularly of that part controlling the skin vessels, as is indicated by the striking effect of such stimuli upon the volume of a limb when measured plethysmographically. Mental activity in all its forms is accompanied by a similar pressor effect upon the vasomotor centre, which is likewise known to affect the skin circulation. During the waking hours, therefore, the vasomotor centre is in uninterrupted activity, and the result must be the production of a condition of fatigue in this centre proportionate to the amount of stimulation. If this fatigue is sufficiently pronounced, the centre will relax and sleep ensue in spite of even strong sensory or mental stimuli. If the fatigue is less marked, as is normally the case at the end of a waking period, adequate relaxation takes place only after the withdrawal of sensory and mental stimuli, and our voluntary preparations for sleep consist essentially in devices to minimise these stimuli. That the vasomoter centre is susceptible to fatigue the author has shown to his own satisfaction by experiments consisting in the continuous stimulation of sensory nerves (sciatic) in curarised and narcotised animals. The great rise of blood pressure that results from such stimulation soon passes off more or less completely, and that this result is owing to fatigue of the centre rather than to fatigue of the muscles in the walls of the blood vessels is indicated by the fact that the blood vessels in the ear of a rabbit may be kept in a condition of strong contraction for a long period (over an hour at least) by constant tetanic stimulation of the peripheral end of the cervical sympathetic nerve."

Whatever the exact cause of sleep is, at all events it seems to be proved beyond doubt by Mosso and others, that during normal sleep there is cerebral anæmia with corresponding vascular dilatation of the skin, and in directing our treatment in many of the forms of insomnia we should take cognizance of the fact, and whether we agree with Bayliss and Hill, that the brain vessels themselves possess no

vasomotor fibres and that the volume of circulation through them is regulated by the variations of arterial pressure in other parts of the body, or believe with others, that vasomotor fibres exist in these brain vessels, it makes no difference in the way of treatment. Germain Sée's classification of insomnia seems to be very generally adopted, and for those who are not familiar with this I might say that it is as follows :

1, Dolorous ; 2, digestive ; 3, cardiac and dyspnœal ; 4, cerebro-spinal and neurotic (general paralysis, acute and chronic anæmia-hysterio-hypochrondiasis) ; 5, psychic insomnia ; 6, insomnia of physical fatigue ; 7, genito-urinary ; 8 febrile and antitoxic ; 9, toxic.

It is beyond the scope of this paper to discuss the diagnosis of insomnia in general, but it is with the cases coming under the heading cerebro-spinal and neurotic we are chiefly concerned ; and in regard to these there is the greatest difference of opinion as to treatment Long ago, when a student under the revered Dr. Joseph Workman, it was pointed out to me in the so-called cases of cerebro-spinal and neurotic insomnia there was little to hope from the protracted administration of hypnotics, sedatives, and narcotics, but, on the contrary, we might look for results the opposite of satisfactory. In those days chloral and bromides were the fashionable remedies, and chloral claimed its victims by the hundreds, and nearly every case of acute mania admitted to the wards of the hospital had been given chloral to excess, with most harmful results. In a general way the conclusions reached by Dr. Workman were quite correct, although capable of certain modification, and possibly, as pointed out by Brush, of Shepherd Asylum, the great danger in all these cases is the routine practice of giving hypnotics in insomnia. Those of us who have been in the habit of receiving large numbers of acute cases of insanity for treatment have had ample opportunity to form well-defined opinions on this subject, as the general practitioner seems forced, when there is delay in obtaining admission for a patient to an institution for the care and treatment of such cases, to adopt the routine administration of hypnotics, not only with the hope of cure, but also as a means of keeping a restless patient quiet. We are all alive to the fact that in a sense loss of sleep is more quickly fatal than loss of food. This point has been well illustrated by De Manassein, who has shown that while dogs could be saved after twenty or twenty-five days' starvation, absolute loss of sleep for 96 to 120 hours was certainly fatal. While in the former case the brain was almost normal, in death from loss of sleep it was the predilection spot of severe and irreparable lesions. Sée noted also rapid fall of temperature (6° to 8°C.) below

normal, slowing and weakening of reflexes, disease of red blood corpuscles, stagnation of white corpuscles in lymph channels, capillary hæmorrhage in brain, and an abnormally dry and anæmic state of the spinal cord. Whatever may be the cause, the disorders of sleep play an important part in the genesis of nearly all cases of acute mania, and every alienist is sufficiently alive to the fact that a few hours of normal sleep are of more importance to his patient than anything else. These few hours of normal sleep generally mark the first step towards recovery, and it is during these hours that the over-wrought nerve cells made their first effort at repair. Cytothetic changes commence, and very frequently go on, under judicious management, until complete cytothesis is established. Now, how shall we secure normal sleep, or even an approach to normal sleep, in such patients? In private practice, without the aid of skilled and capable nurses, the question is oftentimes unanswerable, and we are perforce driven to the adoption of methods we should be quite willing to avoid under more favourable circumstances. We have our choice of a long list of drugs, ancient and modern, and in this day of chemical marvels very few months pass without a new claim for the discovery of a perfect hypnotic. It is interesting to turn up the back numbers of medical journals and read of the discovery of the numberless hypnotics, each just a little better than the one previously added to the list, and each with its band of enthusiastic admirers, willing to add testimony to the virtues of the drug. I am afraid that I cannot claim to have gone thus far in life without little enthusiasms of my own for promising drugs, enthusiasms developed by some favourable results; but in the end there has been disappointment in the search for the hypnotic panacea—chiefly, I fancy, because it is difficult to find any particular drug likely to meet all the physiological requirements. If, as is claimed by Maurice de Fleury, attacks of insomnia are generally caused by either increase or decrease of arterial pressure, the failure of one particular drug to meet all cases can easily be understood.

In the sleeplessness associated with acute mania, drug treatment is at times extremely valuable in the early stages, but my experience has been that, if marked beneficial results do not occur almost at once, they will not appear at all, and harm will result from the drug treatment. It is doubtless true that some of the modern hypnotics are better than others, and the value of these in particular cases will no doubt be brought out clearly by those who follow me in this discussion; but I am strongly impressed with the advisability of substituting other treatment when possible, such as effusions easy of application, massage, etc. Without drugs and by simple physical

means it is easy in many cases to restore normal arterial tension and cause sleep. In the insomnia of acute mania the warm bath is oftentimes of the greatest value. Our custom is to use water at a temperature not exceeding 104° F., and this is continued for twenty minutes or more while cold applications are made to the head. The bath at 104° F. is certainly much safer than one at 110° F., as advised by some authors, and there is less danger of inducing collapse, a danger never absent in a case of mania. Of course the warm bath is contra-indicated where heart failure is threatened or where organic heart trouble is present. Those who have seen excited patients actually fall asleep in the warm bath can easily believe in its advantages. Its good effects can be understood when we study the physiology of sleep, and the whole procedure is devoid of the objection which so frequently applies to drugs, namely, that the bodily functions, particularly the assimilative powers, are impaired. That this frequently occurs with the continued administration of hypnotics has been proved time and again.

The danger of collapse during or after the administration of hot baths has been referred to ; but certainly it is not greater than to be feared from even such apparently innocent drugs as trional and sulphonal. Van Schaik states that trional has an inhibitory action upon the secretions, seems to possess a stimulating effect, is well borne by the stomach, is easily absorbed by the rectum, and fails to produce unplersant after-effects, It certainly possesses many virtues, but at times is borne very badly, and a case of poisoning recently reported would go to show that even trional is not always safe. In this case 20 grains had been given daily, and as a result there were hebetude, ataxia, tremour, transposition of words, psychic depression, and weakness and incontinence of urine. In my own experience I have seen unpleasant results follow the administration of even small doses of trional. Perhaps, I have laid too much stress on sleeplessness in acute mania, but to my mind it is a very important subject, and so frequently defies routine treatment. Sometimes, too, it is surprising how quickly the sleeplessness yields. Within the last few weeks I have seen persistent insomnia in a maniacal case in which there was extreme restlessness give way before nothing more complicated than rest in a hammock slung under shady trees all day long.

Sometimes the time-honoured cup of hot milk at bedtime induces the sleep habit, and where a stimulant is indicated a hot toddy is oftentimes worth a dozen doses of choral or its equivalent.

Insomnia occurring in neurasthenia is possibly one of the most difficult and unsatisfactory forms to deal with, but a study of the arterial

pressure at the radial pulse will almost invariably show that in this condition the pressure is lowered. In many cases, as suggested by De Fleury, where the patient with asystole cannot sleep, it is because the arterial tension is low. If his feeble heart is strengthened with digitalis sleep is possible. In many cases one can substitute the dynamic agents, massage, frictions, douches, and transfusions, and at the same time caffeine and digitalis can be employed as heart tonics. It is with the neurasthenic cases the amateur doctors who exist in every community have their most satisfactory experiences in the way of suggestive lines of treatment as unique as they are absurd. In the *British Medical Journal*, September 29th, 1894, we find a clipping from the *Glasgow Herald* in which one of these cures for sleeplessness is recommended. It is as follows:—"Soap your head with ordinary yellow soap; rub it into the roots of the brain until it is lather all over; tie it up in a napkin, go to bed, and wash it out in the morning. Do this for a fortnight. Take no tea after 6 p.m." The *Journal* advises following the directions about the tea and leaving the instructions regarding the soap as a last resource. Insomnia is one of the diseases of civilized life and exceedingly common among the highly intellectual and brain workers. It is a condition which may be cultivated and sometimes may certainly be called a bad habit, for after all, as pointed out by A. W. McFarlane, of Glasgow, habit plays an important part in the development of some forms of insomnia. Sleeplessness, he suggests, may arise in persons in health from bad habit alone. Nurses often suffer in this way. They sometimes curtail their sleep unduly to find, when their services are no longer needed, they cannot sleep. Their brain cells have acquired the bad habit of maintaining the activity when they ought to be reposing.

It is a simple matter to give advice to those who have acquired the sleepless habit; it is difficult for them to follow it, for sometimes the very attention that is directed to the bad habit makes it worse. We are told that a good habit of sleep should be sedulously cultivated by falling asleep without delay immediately after retiring. We cannot sleep if we continue to think, we are told. The tossing, restless one says, "Tell me how to avoid thinking when in bed, and I will follow your advice." Some men are so harassed during the day that they are driven to do their thinking in bed, but it undoubtedly means burning the candle at both ends. For these over-wrought and oftentimes nervous people I have found a glass of hot milk on retiring useful in some cases, in others half a pint of bitter ale answers every purpose. Oftentimes, too, it is necessary to arrange the patient's diet on a physiological basis. I agree with Dr. McFarlane that regularity

in the habit of retiring is of more importance than going early to bed, and certainly when one who has suffered from insomnia has succeeded in overcoming the bad sleep habit he should be slow to endanger his health and happiness by doing anything likely to induce insomnia again.

Change of air is extremely valuable, and for most people of nervous type an outing under canvas in the northern woods of Canada is a sleep producer of the most remarkable kind. I have seen men haunted for years by the demon insomnia go to these woods, and while there develop a sound sleep habit which added years to their life. After the first night at camp sleeplessness is almost unknown. Personally I prefer advising almost anything rather than drug treatment in the common forms of insomnia, and feel satisfied that we are playing with fire when we resort to the use of hypnotics, except as a temporary expedient. Of course, we should not forget in these different forms of insomnia that sleeplessness is frequently something more than a bad habit: it is a symptom of other trouble, and it is necessary to discover and treat the underlying cause.

If neurasthenia is to be regarded as one of the autotoxic diseases—and there is abundant evidence to support this view—in all probability the effect will disappear with the removal of the cause. The same remarks apply to all of the cases of insomnia resulting from toxæmia; and when we get clearer light on autotoxis than we have at present no doubt it will be a simple matter to improve our methods of treatment. In neurasthenia, autotoxis will admirably explain the etiology of the disease, as has been pointed out by Van Giessen and others. With insomnia accompanying surgical operations I have had little experience, but the subject has been deemed worthy of a good deal of attention by those who have had ample opportunity to observe.

G. G. Van Schaick concludes that insomnia, from whatever cause, is an important complication of surgical disorders. Its relief is necessary for the comfort of the patients, improves the prognosis, and naturally assists recovery after operation. Where pain is the chief factor morphine is the only drug that will relieve with certainty, although there is a strong feeling in favour of the use of trional.

In a general way, then, I may say that many writers are impressed with the belief that in the majority of cases of insomnia drug treatment is to be avoided, if other more simple methods of inducing normal sleep are found successful. Certainly the simple methods should be tried before any drug treatment, and in any case the condition of the arterial pressure should be carefully studied and noted before any line of treatment is decided on.

II.—Reynold Webb Wilcox, M.A., M.D., LL.D.

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The treatment of insomnia is the treatment of a symptom; an important symptom, it is true, but still it is a symptom. I am in thorough accord with Patrick [1] when he says: "Insomnia is the result, not the cause, of cerebral affections, and it does not give rise to organic disease. It may be the earliest manifestation of otherwise latent brain disease, and the conscientious physician will search this out and treat it; not attempt to avert some indefinite and vaguely threatened disaster by attacking the insomnia." As for its relationship to other pathological conditions we know that it is a symptom of various habits, for example, alcohol, coffee, tobacco. Here prevention is essential, and hypnotics are only temporarily necessary. If study or business are taken into the hours of sleep, this insomnia, truly a simple insomnia, is to be treated antipathically—the habit of sleeping must replace the habit of sleeplessness. Measures other than drugs are required. If sleeplessness is the result of pain, another symptom, the cause of the latter must be sought out and relieved, either by the cause being removed, or if this is impossible, a narcotic, not a hypnotic, is indicated. If there are circulatory disturbances the condition of the heart and blood vessels needs investigation and hypnotics have but a temporary use. Should the patient be afflicted with goutiness, and Ewart deserves our thanks for coining a useful term, quite likely sodium phosphate, sodium salicylate, piperazine, or uricedine in this instance will prove to be a valuable hypnotic. Again, if we are dealing with kidneys in which arterial degeneration has taken place, systemic blood vessels are contracted and the wall of the left ventricle is thickened, the nitrites may relieve the insomnia. In the anæmia, or rather hydræmia, of the young woman, iron in organic preparation will be a true soporific. Instances might be multiplied.

It is essential that we have at our disposal safe, reliable, and pleasantly acting hypnotics. Sleep is as essential as food; the organism cannot dispense with either. They are of nearly equal importance. There is scarcely a morbid condition of which the prognosis does not become markedly worse if insomnia supervenes. Just so far as impaired nutrition militates against cure so far sleeplessness becomes an important factor.

Drugs alone are not sufficient; the cause of the symptoms having been ascertained and, if possible, removed, physical therapeutics should be employed. That portion of the subject has been entrusted to one

thoroughly competent, both by education and experience, to present it. When all has been accomplished that is possible from hygienic and physical measures there yet remains an important place which drugs, and drugs alone, can occupy. The drug treatment of insomnia is well worth our careful study. Routine prescribing is utterly indefensible; equally so is the reckless administration of drugs. Insensibility is not sleep. The question is not "how large a dose can the patient survive?" but "how little of the drug will produce a sleep closely approximating the normal, and what remedy will give rise to the fewest and most insignificant after-effects?" We desire sleep-persuading not sleep-compelling drugs.

The Mode of Action of Hypnotics.—To possess an accurate knowledge of the action of hypnotics it is evident that we should have at our disposal a complete theory of the sleep phenomenon. A very cursory reading of the existing works upon physiology demonstrates that this is not the case. If they treat of this subject at all, and some do not in any satisfactory way, it is dismissed after a brief reference to the theory of cerebral anæmia as a causative factor. That anæmia alone is entirely inadequate to explain the phenomena of sleep is evident after even a superficial consideration. With few and unimportant exceptions, the fact that during sleep the brain is anæmic is admitted; the relation of anæmia to sleep is a problem which has occupied the minds of many investigators. As we come nearer to this relation we are likely to reach a clearer understanding of the sleep phenomena. That cerebral anæmia is not caused by constricted blood vessels is evident, else we should have somatic evidence of such constriction as would be shown by pallor[2]. Besides, the probability that cerebral blood vessels are deficient in motor nerves is also evidence against this theory. That cerebral anæmia alone cannot cause sleep is evident when we consider what happens after a severe hæmorrhage, producing a true cerebral anæmia, when wakefulness, not sleep, is a marked symptom.[3] That there is a definite relationship between the circulation in the brain and general arterial pressure is evident from the work which had been done since 1887 by Gaertner and Wagner[4], Roy and Sherrington[5], Bayliss and Hill[6], and finally by Renier and Schnitzler[7], and that there is an enlargement of the limbs during sleep was shown by Mosso[8], as early as 1881, by his plethysmographic experiments. When we consider, as was mentioned above, that it is probable that the blood vessels in the brain possess no motor fibres, the importance of these observations becomes evident. The recent conclusive experiments of Howell[9] making use of the plethysmograph must be interpreted as indicating dilatation of the

blood vessels of the arm, and this probably due to relaxation of the tone of the cutaneous vessels. This appears to be convincing, despite the objection of Meltzer that this dilatation might be due in part to relaxation in the tonicity of the skeletal muscles during sleep. The observations of Howell have been conducted with such care that his theory of the immediate cause of sleep merits quoting at some length. It lies in a vascular dilatation (of the skin) that causes a fall of blood pressure in the arteries at the base of the brain, and thereby produces an anæmic condition of the cortex cerebri. This condition of anæmia in connection with the withdrawal of external stimuli, causes a depression of the psychical processes of the brain cells below the threshold of consciousness. In addition to the effect of the cerebral anæmia, an accessory favouring condition may be found in a certain degree of fatigue of the parts of the brain mediating psychical processes. Portions of the sensory and association areas of the cortex must be active during the greater part of the waking period, and probably therefore lose their irritability to a greater or less extent Upon the withdrawal of the normal blood supply their irritability will tend to fall more quickly below the threshold of consciousness in consequence of this fatigue. According to Howell, then, the three factors which combine to produce normal sleep are: (1) A diminution of irritability, caused by fatigue, of large portions of the cortical area (2) voluntary withdrawal of sensory and mental stimuli involved in the preparations for sleep; (3) the above described diminished blood supply to the brain. Substantially the same theory is advanced by Hill [10], save that, for him, the cerebral anæmia is brought about by relaxation of the tone of the splanchnic area which reduces general arterial pressure and correspondingly reduces the venous; the latter factor tends to retard the flow of blood through the brain. As Howell very properly remarks, it is possible that there is a lessened volume of blood in the vessels of the viscera, but this requires experimental evidence before we accept it as a fact. So much for the circulatory theories. It will be admitted, I think, that various general measures based upon these theories, notably the use of baths, may tend toward the relief of insomnia; that they do not materially aid us in assigning the mode of action of drugs is true.

The chemical theory of sleep, whether we take into consideration that of oxygen as advanced by Sommer [11], or of the lactic acid of Preyer [12], or of the catabolism which results in combined oxygen and carbon (CO_2) of Pflüger [13], and in advance but a step to Cappie [14], who believed that there was (1) diminished molecular activity of the cerebral cells coincidently with capillary anæmia of the brain, and conse-

quently (2) that the brain occupied less space. These statements, taken in connection with the studies of Hodge [15], twenty years later, which demonstrated that cell volume and contents diminish after fatigue, bring us nearer a working hypothesis for the action of hypnotics.

The theory of the neuron, as advanced by Rabl-Rückhard [16] in 1890, in a far too brief paper, opened up great possibilities in neurological theory and practice. These, Lépine [17] and Duval [18] embraced apparently independent of each other, and Azoulay [19] added a short contribution. Due honour should be accorded to Ramon y Cajal [20], who demonstrated motility in nervous structures, and although Dercum [3] traverses some of his conclusions, yet he leaves the matter in a very satisfactory condition. Whatever may be the ultimate fate of this theory, it explains far better than any previous one many physiological phenomena. For him sleep is explained in a very simple manner: "The cortical cells in the motor area have processes extending toward the surface—dendrites—and a protoplasmic process extending downward through the white matter of the brain, the internal capsule, the crus, the pons, the medulla, and into the spinal cord, where it terminates in a brush-like extremity—the end tuft. Here it has a certain relation with the motor cells in the anterior horn of the cord—probably one of contact, though that is not definitely known. If the nerve cells retract this contact is broken; if the abnormal contraction of the nerve-process is relieved for the time being, contact once more takes place." Evidently, if the neurons are functionally active, their dendritic processes must be in contact; without this, consciousness is impossible. When the nerve cells are exhausted by fatigue, there is every reason to believe that their volume shrinks, and it is, therefore, more and more difficult for them to remain in contact. When relaxation comes, the processes retract and unconsciousness, that is sleep, supervenes.

From this hasty sketch of the various theories of the sleep phenomena it seems fair to conclude that from the direct action of substances introduced into the circulation, the neurons retract their processes, and, for a shorter or longer time, sever their relations one with another, and that during this severance consciousness is abolished and sleep supervenes. In starting from this point we should not underestimate the value of the labours of those quoted in this paper, but give them due credit, because it is only through them that we have come to a working theory. The question now arises as to what drugs influence the protoplasm of nerve cells so that this retraction may take place.

As was pointed out by Leech,[21] the alcoholic radicles (alkyls C_nH_{2n+1}),

of which methyl ($C H_3$) and ethyl ($C_2 H_5$) are familiar examples, depress the functions of the higher cerebral centres, and that chlorine, among other elements, tends more than the alcoholic radicles to depress the functions of the lower centres. It is very probable that the true explanation of their action is that it is upon the protoplasm in the way of causing the dendrites of the neuron to contract, and as a result sleep is induced. That anæsthetics are protoplasmic poisons chloroform ($C H Cl_3$), a chlorine compound, furnishes evidence. Binz[22] many years ago demonstrated that morphine produced alterations in nerve cells which reminded him of those caused by the action of quinine on the white blood corpuscles. Besides, according to Ehrlich, such changes produced in nerve cells would tend to lessen functional activity, and a diminution or alkalinity by the products of tissue waste would also lessen oxidation in the brain cells by contracting the protoplasm at the same time that the changed reaction lessened their affinity for oxygen. According to Binz, chlorine, amongst other elements, is a hypnotic because it tends to increase the formation of acid (diminishes alkalinity) in the nerve cells. Since it is admitted that a combination of the alcohol radicles with chlorine increases the hypnotic action of the former, it seems fair to conclude that not to one factor but to both should be attributed the fatal effect of a drug ; that each has a share in producing the end result. Experience has shown that the particular combination of alcohol radicle and chlorine gives increased hypnotic power, but as well presents the disadvantage of seriously depressing the circulatory and respiratory centres in the medulla. Inasmuch as King has demonstrated that the amide radicle ($N H_2$) stimulates just when this combination depressess, we have a leading suggestion as to what should be the composition of a chemical hypnotic.

Since the possibilities of carbon combinations are practically limitless, we may justly expect that a synthetic compound shall be produced which shall be a protoplasmic irritant without being a poison, which shall act upon the most highly developed tissue—the nervous—and upon the higher centres to a greater extent than upon the lower centres at the base of the brain, and that it shall be of sufficient molecular weight that its effects shall be fairly durable.

The Value of Individual Drugs, Especially the Newer Hypnotics.

It is not, I think, profitable to go over the familiar ground of the somnifacient powers of opium and its alkaloids—morphine, narceine and codeine. Undoubtedly it is of all drugs the most certainly

hypnotic, but we should hesitate before we employ a remedy possessing such varied powers for good or evil in order to obtain a single physiological effect. The dangers of habituation are too great, the untoward effects too numerous to permit of this save as a last resort. Even if these facts were not sufficient, the use of morphine in the last decade of the nineteenth century as a hypnotic seems to be a confession of paucity of resource not to be expected in these days of drug-plenty. Of the salanaceæ the alkaloids hyoscyamine, hyoscine and scopolamine seem to possess a peculiar usefulness in the treatment of the insomnia of the insane, especially of those conditions characterised by excitement. All present various disadvantages, require rapid increase of dose, and are by no means ideal hypnotics. Of the urticaceæ the constituents of Indian hemp, cannabinin and cannabinon, are rather narcotic than hypnotic, and this is also true of piscidin, from Jamaica dogwood or the leguminosæ.

There is, however, one drug of vegetable origin which should occupy our attention for a moment. This is an alkaloid by name pellatin, which is obtained from the Anhalonium Williamsi, commonly known as pellote, a cactus found in Mexico. The alkaloid, which is isolated from the crude drug to the amount of 0.74 per cent.,[23] occurs as a colourless, amorphous, intensely bitter powder, of slight solubility in water, but readily in alcohol, ether and chloroform. Its chemical formula is (C_{13} H_{21} NO_3). The chloride crystalises readily, is extremely soluble in water, and, since it does not produce local irritation can be administered hypodermically. Heffher,[24] in his experiments upon frogs, found that slight narcosis followed its injection in from ten to fifteen minutes. The reflexes were somewhat diminished, and strong irritation was necessary to obtain response. After twenty or thirty minutes there came a distinct increase of irritability, followed by spasms, recalling those of strychnine tetanus. This period of increased irritability of the reflexes may continue with undiminished intensity for several days. If large doses are now administered this condition sooner or later passes into one of complete paralysis. The irritability of motor nerves is destroyed only after long periods of spasm, and it is likely there is induced an increased excitability of the spinal cord. A personal experiment demonstrated that the pulse-rate is diminished for about an hour, drowsiness is marked, and sleep supervenes about two hours after its administration, preceded by a feeling of weariness, weight of the limbs and eyelids, and disinclination to bodily and mental exertion. The drug is probably excreted by the kidneys : at least, a small quantity of it can be detected in the urine. Pilez[25] has employed this remedy in fifty-eight cases, generally in the

dose of one-third of a grain, although it is best to use one-half of this quantity on first trial. He deemed the result to be satisfactory if the patient fell asleep in from one-half to one and one-half hours after injection, which was made at nine in the evening, and remained asleep during the entire night. In one-half of these cases the result was satisfactory, in over 29 per cent. the result was moderate, and in nearly 21 per cent. failure ensued. Jolly,[26] in an experience covering forty cases, found in one-half of these that when given during the day one-third of a grain caused languour and sleepiness in quiet patients, but this was obtained only after three-fifths to grain doses, which caused several hours' sleep within one-half to one hour after their administration. In excitable and delirious patients these doses were insufficient, and even two grains would not produce sleep, but merely calmed the patient for several hours. In the second half of his cases, when administered in somewhat larger doses in the evening he obtained very satisfactory results. Save some slowing of the pulse, giddiness, and restlessness before sleep in a few instances, and rarely similar results upon awakening, there were no untoward symptoms produced by the drug. Pilcz, however, reported that heaviness of the head and nausea had been sometimes observed. Jolly found that patients suffering from painful troubles (tabes dorsalis) slept, but that their pains returned on awakening. Quite recently Hutchings[27] reports four cases in detail among the eleven who received over 100 administrations with rather favourable results, although in several instances it seemed to have no effect in moderate doses. The sleep produced was singularly calm and natural, and the patients could be readily aroused. No unpleasant after-effects—as headache, nausea, or coated tongue—were observed, and the patient awakened calm and refreshed. If the drug is given in the morning two or three hours' sleep may be obtained, but when administered at bedtime it is much longer, and may last during the entire night. It does not affect the appetite nor influence the secretions. When the drug was given in full doses it had a tendency to cause vertigo, but this was only noticed when the patient was not in a recumbent position. In no instance, however, was this symptom severe enough to call for treatment. Jolly seems to believe that one grain is the proper dose, and one not likely to be followed by any ill effects. Should further observation confirm the results of these observations I am of the opinion that we have in pellatine an addition to our therapeutic resources which is of real value.

We need not delay to consider those substances of inorganic chemistry of reputed hypnotic properties, as for instance the bromides.

At times they are useful, it is true, but as it has always seemed to me by their soothing action upon the general nervous system, by shutting out external sources of irritation, as does a door, which closed, keeps out disturbing sounds. We come now to the carbon compounds which will be separated into series the members of which closely resemble each other.

I. Oxygen Derivatives of the Hydrocarbons.

(1) *Alcohol.*—The only alcohol which interest us as a hypnotic is amylene hydrate (di-methyl-ethyl-carbinol) which was introduced by Von Mering in 1887. From this drug of low specific gravity (.815 to .820) we should expect speedy and not very lasting effects and this is the result of experience. In drachm doses dissolved in an ounce of water (it will float upon water if there is an insufficient quantity of the vehicle) or, better, given in a glass of Burgundy, its administration is not difficult. Sleep is likely to follow in from one-half to one hour, and last from six to eight hours. It is rather more efficient than paraldehyde, acts more quickly, and in ordinary doses produces none or trifling ill-effects, but patients readily become habituated to it, and no results can be obtained. In several instances of failing heart muscle I have succeeded in giving the patients needed rest, but in all it became necessary to seek for another remedy.

(2) *Ethers.*—Methylal (methylene-di-methyl-ether) has been in use since 1868 for various purposes. It was chiefly through Persovali that it became known as an hypnotic. This is also of low specific gravity (.855) and like amylene hydrate it acts quickly but does not yield so many hours of sleep and even more rapidly establishes an habituation. From one-half to one drachm doses in water or syrup I have seen some brilliant results follow its use in delirium tremens, but quite as frequently failure follows.

(3) *Aldehydes.*—(*a*) Probably paraldehyde, introduced by Cervello in 1882, is the most reliable of this group which includes some derivatives. This is of higher specific gravity (.998) and its effects are more durable. It is best given in from one-half to one drachm doses dissolved in glycerine, or nine parts of water. Its first taste is not unpleasant, but it produces a most disagreeable and lasting odour in the breath. It does not cause much circulatory depression, but like all aldehydes it irritates the intestinal and respiratory mucous membranes. In fact it is "wonderfully innocuous" as Aitkin[28] puts it, but if it fails to produce sleep, it acts as an excitant. And further dangerous symptoms have followed its use as Whitaker[29] and others have shown. On account of its disagreeable after-effects we should

not expect a habit to be formed, yet quite recently several instances have been reported of delirium tremens resulting from the habitual use of this drug. While this remedy may be useful in simple insomnia or as a temporary help toward forming a sleep habit my own experience leads me to make use of it with comparative infrequency.

(*b*) Undoubtedly the most popular hypnotic is chloral (chloral hydrate), and it is one of the oldest, having been introduced by Liebreich in 1869. It is the one from which a habit is most frequently formed and from my observation this is prevalent among the clergy. From its high specific gravity (1502) we have a comparatively durable action, and from its ready solubility in water (less than its own weight) early effects (ten to fifteen minutes). On the other hand while in from ten to twenty-grain doses it is an efficient and ordinarily safe hypnotic, the large number of instances of poisoning, accidental or not, warn us that this drug should have a limited use. The great danger arises from its depressant action upon the circulatory apparatus, which frequently cannot be properly estimated and what is greater, the danger of the formation of the habit, which should always be borne in mind. Personally I feel that with the exception of an insomnia occurring in an individual whose heart is hypertrophied and upon whose arteries its vaso-dilator effects are important, and whose kidneys present the condition commonly known as chronic interstitial nephritis, none other demands the use of chloral.

Of substitutes for chloral, butyl-chloral and chloral-ammonium have been so infrequently employed that they need not detain us. The depressing effect of this drug upon the heart has led to the insertion of various radicles which would obviate this difficulty.

(*c*) The most successful result is seen in chloral foramide (chloralamide), when the amide radicle ($N H_2$) evidently lessens the dangerous effect of chloral upon the heart. Introduced by von Merin in 1889, this remedy has received attention from Sympson [30], Egbert [31], Marcus [32], Reichmann [33] and others. It is rather slowly soluble in cold water, but quite readily in alcohol; heat and alkalies, however, decompose it. Its slightly bitterish taste is best disguised by the use of brandy and elixir of orange or tincture of cardamom as a vehicle. A safe dose is 30 grs. given as above, and single doses of double this quantity are not excessive. Sleep does not appear so quickly as with chloral, but it is quite as certain and lasting; the awakening is calm and without headache. Its dangers are insignificant. After it has been used for a month the dose must be increased; the nutrition does not suffer. I believe that a habit is acquired with difficulty; but one instance has come under my observation, and the cure was readily secured within

a month. We can assuredly state that this remedy has long passed the experimental stage, and to-day it should be classified among our safest and most satisfactory hypnotics. It is particularly useful in the insomnia resulting from excessive mental activity (Collins [34]), and, I believe, the safest of the hypnotics for the insomnia of patients suffering from cardiac disease.

Of chloraloze (anhydro-gluco-chloral), introduced by Hauriot and Richet [35] in 1893, I can record little but disappointment. It was thought that in a small dose, 3 to 8 grs., given in capsules on account of its insolubility and bitter taste, we would find in it a valuable substitute for chloral. Schnirer [36] and Fleming [37] added to our knowledge of the drug, but the adverse reports of Williams [38], Bardet [39], and Touvenaint [40], left no doubt but that it was too dangerous for ordinary use. In a few instances collapse followed the exhibition of a large dose.

(*d*) Another drug of very doubtful utility is hypnol (mono-chloral antipyrin), in all probability a mixture which was introduced by Bordet. This was proposed by Filehne as an hypnotic in from 15 to 30 gr. doses dissolved in water, which gives a tasteless solution. It seems to possess very feeble hypnotic power, and in the few instances in which I have employed it failures were the rule.

(*e*) The last aldehyde to be mentioned is hypnone (aceto-phenone), introduced by Dujardin-Beaumetz in 1885. When liquid it is colourless or slightly yellow, of a specific gravity of 1032, and has a decidedly unpleasant taste. It should be given in from 2 to 4-drop doses in capsules. It is likely to disorder digestion and impart an offensive odour to the breath. I have administered this drug but rarely, and never successfully.

II.—Sulphur Derivatives of the Hydrocarbons.

Sulphones.—Sulphur alcohols and others differ from the corresponding oxygen derivatives in their being able to combine.

(*a*) Sulphonal (di-ethyl-sulphon-di-methyl-methane) was introduced by Kast in 1888 This occurs as colourless, odourless, nearly tasteless prismatic crystals, which are soluble in about 500 parts of cold water. After a dose of from 7 to 30 grs. sleep, lasting several hours, follows in two or three hours. After large (drachm) doses mental hebetude and symptoms resembling paralysis supervene. Its marked insolubility would lead us to anticipate a slow action, and in practice the time above stated is generally prolonged so that frequently sleep does not take place until the following day. To obviate this the drug should be finely powdered and administered in hot bouillon or milk three or

more hours before sleep is desired. The reports of Johnston[41] and Fürst[42] are generally favourable, while the fact that exanthemata appear after its use has been noted by Walters[43] and Taylor[44], among others. Of much more importance is the occurrence of hæmatoporphyrin in the urine after its use. This has been noted by Garrod and Hopkins[45] as a normal constituent, in traces, but found in much larger quantities after continued use of the drug. Abdominal pain and vomiting are the usual symptoms ending in fatal collapse. Harris, Anderson, and Nolan have furnished histories of three fatal cases in women who had taken this drug for long periods. Hot fluids are said to diminish the tendency to hæmatoporphyrinuria. Or the drug may be given only every second day. Even its careful administration may result in heavy and dull feelings, unsteady gait, headaches, nausea, and vomiting. In view of the uncertainty as to the dose or length of time required to produce serious symptoms, and the prevalence of the sulphonal habit among the laity, it is the duty of the careful physician to discourage as much as is possible the use of this drug.

(*b*) Trional (di-methyl-sulpho-methyl-ethyl-methane) was introduced by Barth and Rumpel[46] in 1890. This occurs as colourless and odourless crystals which dissolve in about 320 parts of cold water, forming an almost tasteless solution. The remedy is effective in doses of from 7 to 30 grs. given one to two hours before sleep is desired. It gives rise to but few after-effects, and these of less importance than those of sulphonal. Vertigo and nausea, as well as *malaise* and formication of the limbs, have been noted by Spieglitz[47]. The reports of Collatz[48], Vogt[49], Goldmann[50], Hewitt[51], Mattison[52], Randa[53], Mabon[54], Brie[55], and Boettiger[56], are representative. This remedy is more prompt in its action than sulphonal; although its solution is slightly bitter it is more readily taken; the resulting sleep is of shorter duration, although with this we may obtain better sleep upon the second night, the same dose being given. Habit is formed with considerable difficulty, although it is not unknown. Increase of dose is not so necessary as with many other hypnotics. On account of its readier solubility there is less likelihood of cumulative effects, and the danger of hæmatoporphyrinuria is not great. Yet experience has shown that in addition to the nausea and vertigo, mentioned above, headaches, slight inco-ordination, tinnitus aurium, unpleasant diaphoresis, and disturbed nutrition have been observed. Some of these may be lessened or obviated if the remedy is frequently (every five to seven days) omitted, a daily movement of the bowels insisted upon, and an alkaline water or seltzer be freely administered during the day. Instances of exanthemata and chronic poisoning are by no means rare according

to my own observation and that of Hecker[57] and Young[58], so that prolonged administration is to be avoided.

(*c*) Tetronal (di-ethyl-sulphon-di-ethyl-methane) occurs as colourless, odourless shining plates, and is somewhat less soluble than trional. In solution it is tasteless, and is administered in the same dose. Theoretically, this should be of more powerful hypnotic action because of the increased number of ethyl radicles and of slower effects. A limited experience demonstrated that it presents no particular advantages over its congener, trional.

III.—Urethanes and their Derivatives.

But two examples of this series are introduced, and but one of these, the first, is important.

(*a*) Ethyl urethane, commonly known as urethane, was introduced by Von Jaksch in 1885. This occurs as colourless, odourless crystals, which are soluble in an equal part of water, but are decomposed on warming with either acids or alkalies. In dose of from 15 to 45 grs. it is a mild hypnotic and devoid of danger. Its ready solubility would lead us to expect rapid action, transient effects and easily acquired habituation, and these in practice have been found to exist. The remedy is useful when a change of hypnotics is desirable, and even then it should be considered as unreliable.

(*b*) Chloral urethane, also known as ural and uraline, is probably not a chemical combination. It is a solid which is insoluble in cold, but decomposed by hot water. Dissolved in alcohol, it can be administered in the same dose as urethane. Poppi[59] found that it but slightly affected the blood pressure, although it quickened the pulse rate. As somnal is known an alcoholic solution of choral urethane, which is given in dose of thirty drops. A representative report is that of Meyers[60]. Both ural and its solution are intestinal irritants, are feebly hypnotic, and so far as I can learn present all of the disadvantages and none of the advantages of the substances of which it is composed.

IV.—The Amido Derivatives.

But two examples of these are known to be hypnotics, and our information concerning them is meagre.

(*a*) Methyl phenacetine occurs as colourless crystals, but slightly soluble in water.

(*b*) Ethyl phenacetine, a yellow oil, soluble with difficulty in water, but easily in alcohol, is said to be a weaker hypnotic than the preceding. The dose of neither is given by Sayre[61] and Coblentz[62]. These are merely noticed for the sake of completeness.

In this paper those drugs which have been used in recent years as hypnotics have been taken up not because all are available, but in order that we should learn what are our resources. In spite of the considerable number of drugs at our command, I cannot but feel that in all cases it is better for a patient to lose sleep for several nights, if need be, than be forced into unconsciousness. On the other hand, in properly selected instances, we can certainly be of very material assistance to our patients by discreetly making use of hypnotics. For all practical purposes, always keeping in mind that insomnia is a symptom, after omitting the dangerous, unreliable, and objectionable drugs, we have remaining four which are amply sufficient for ordinary conditions.

Following the plan which Leech [21] employed in his most admirable paper, read before the Leeds meeting of this Association, I would classify them as follows:—

1. Potency: Paraldehyde, chloralamide, pellotin, trional.
2. Rapidity: Pellotin, paraldehyde, chloralamide, trional.
3. Duration: Trional (longest), chloralamide, pellotin, paraldehyde.
4. Habituation: Pellotin (slight) trional, chloralamide, paraldehyde (considerable).
5. Safety: Chloralamide, pellotin, paraldehyde, trional.

Using these drugs judiciously, I believe that in no department of therapeutics as in this can we add so much to the comfort and well-being of the patient. On the other hand, in scarcely another can we so readily lay the foundations for temporary inconvenience and lasting detriment. Through our skill the patient can secure "tired Nature's sweet restorer," and peaceful sleep will lend assistance towards the permanent recovery of health.

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HYPNOTICS: THEIR CONTRA-INDICATIONS AND ILL-EFFECTS.

BY

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We have so little exact knowledge of the essential nature of sleep and of the precise effects of the various medicines that induce it or a somnolent state resembling it, that little more can be made than a general statement of the contra-indications to, and the ill-effects of hypnotics.

As to the nature of sleep, some believe that it is an arrest of all the functions of the central nervous system except these essential to life; others that sleep itself is a function. In either case its occurrence is probably largely due to the accumulation of fatigue products —neurotoxin—in the central nervous system. How these fatigue products act is uncertain, but probably by interfering with metabolism. The accumulation of waste products may have a paralysing effect on the protoplasm of the neuron, lessening its affinity for the oxygen of the blood, possibly by diminishing its alkalinity. As a consequence contraction of the neuron or its processes takes place. There is loss of contact of the neurons as a result of such contraction and consequently loss of function in the higher nerve centres causing loss of consciousness. In the lower centres resistance is greater, and there is only a diminution of the vital function, as shown by the slower breathing and pulse-rate, and loss of the reflexes.

Of the physiological disturbances causing sleeplessness, our knowledge is no less imperfect than that of the cause of sleep. If sleep be due to the fatigue products, sleeplessness can scarcely be due to their absence, because they must be present in increased quantities in conditions of wakefulness. In insomnia there is always disturbance of metabolism with inadequate excretion of waste products, and, therefore also, of inadequacy of nutrition. It is possible that on this account there is a loss of stability in the neurons leading to irregularity in the action of many of them in response to the stimulus of the fatigue products. That there is derangement of the functions of the neurons in sleeplessness the loss of mental power and of general physical well-being amply proves.

The loss of power of compensation in any part can be restored only by lessening the labour and improving the nutrition of the part. The treatment of failure of compensation in the nervous system is no exception to the rule. In insomnia the neurons fail to compen-

sate for the overstrain to which they have been subjected and in their restoration all agencies which may interfere with the removal of waste products and increase of nutrition, or lessen their stability, should as far as possible be eschewed.

On theoretical grounds, then, it follows that hypnotic drugs are always contra-indicated, but in practice it is often best " to do a little wrong to do a great right."

In a general way it may be said that hypnotics should not be used in those in which the cause of insomnia is palpable and removable. These causes may be briefly summarized as follows :

1. Digestive derangements, whether from improper food and drink, insanitary surroundings, or from whatever cause.

In this class are to be included nearly all cases of disturbance of sleep in children in whom faults of digestion form the bulk of all their ailments.

In the adult, however, these same causes play a very, if not the most, important part in the production of insomnia, much greater than they are usually credited with. In the adult the insomnia is, however, less often due directly to the disturbance of the stomach and bowels, that is, due to a reflex cause, than it is in children whose nerve centres lack the stability of the adult, but is more often the result of the absorption of toxic agents produced by the ill-digested food in the digestive track.

2. Local irritations, such as dentition, irritable diseases of the skin, disturbance of the urinary tract. These are also most common in children. To these may be added reflex disturbances from diseases of the uterus and its appendages. Eyestrain is credited with being a frequent cause of insomnia as well as other reflex disturbances.

3. Overwork and the neurasthenic condition resulting therefrom. In the majority of these cases, nutrition and excretion play the most effective part, as, with a good state of nutrition and the observance of the laws of sleep, overwork is almost impossible.

4. Anxiety and worry. These should be really included with overwork, as they disturb the stability of the cerebral cells in the same manner.

5. Toxic cases are common. Many of them result from derangements of digestion, and are included under that head. Others result from chronic disease—as gout, lithæmia, chronic constipation, and Bright's disease. With these may also be included toxæmia produced by excessive indulgence in tea, coffee, tobacco, alcohol, and the habitual use or abuse of such drugs as morphine, chloral hydrate, cocaine, etc.

6. A very important group of cases of insomnia is formed by those

suffering from disturbed cerebral circulation, whether due to cardiac, renal, or pulmonary disease, or to disease of the cerebral vessels themselves. The blood supply may be excessive and vascular tension high, as in arterio-sclerosis before cardiac compensation fails ; or defective and irregular, as in dilatation of the heart. While in some of these conditions the stronger hypnotics are the potent means at our disposal of giving relief, not only to the insomnia, but also to the causes of it, yet in many of them their use would be unwise, and might be disastrous.

7. In not a few, sleeplessness is the result of long indulgence in pernicious habits, mental and physical, in regard to sleep, such as, irregular hours, various dissipations, the conning over after retiring of the difficulties and reverses, and perhaps the successes of the day. Such people are loth to believe how much can be done to recover the power of going to sleep at will. It is vain to retail to them the facts of Napoleon, Wellington and Grant being able to lie down on the field of battle at any time and take a short sleep if needed. They should be encouraged in the effort, and every cause of disturbance removed and such conditions sought as will bring most composure of mind.

In the treatment of insomnia, then, our first duty is to seek out diligently and treat intelligently such obvious causes as may exist, as to remedy digestive derangementss whether of stomach or intestines; to stop the ingestion of unsuitable food and drink ; to relieve constipation ; to stimulate the free elimination of fatigue products ; to relieve local irritations and reflex disturbances ; to stop overwork and bring the daily duty within the capacity of the worker ; to relieve anxiety ; to correct as far as possible all disturbance of circulation ; to relieve anæmic and debilitated conditions ; to secure due regard to sanitary requirements ; to cultivate good habits of sleep.

In all this our aim is to remove all sources of irritation, direct or reflex, from the cerebral cells, to supply them with ample nutrition, and to cultivate healthy habits in them.

Not until these indications are met is the resort to hypnotics legitimate, unless it be to overcome a temporary difficulty ; the further use of them is injudicious if not injurious.

Unfortunately there is a large class in whom the cause is not easily discovered nor easily removed ; or it may be quite apparent and yet impossible of removal. Of such are many cases of neurasthenia, hysteria and hypochondria. Many of these have a neuropathic temperament, inherited or acquired. In them, slight causes, mental or physical, may induce insomnia. Astigmatism may give rise to eye-

strain that, though not noticed in health, causes headache or wakefulness in the debilitated condition. Or it may be some slight derangement of the digestive system that is sufficient to prevent sleep in the abnormal state of health. Whatever the cause, though it may be very trivial, judged by the standard of health, in the debilitated condition of the nerve centres it is often sufficient to produce disastrous effects. In the mental habit that has developed, its importance may be greatly magnified. There is a weakness of will power and a ready acquiescence in whatever brings temporary relief, so that the drug or other habit is easily formed and may be difficult to avoid, and, once formed, always difficult to overcome.

When, then, should hypnotics be used ? In acute diseases sleep is often a necessity in order to secure such a restoration of the vital powers as to render recovery of health, or even continuance of life, possible. In sleep, general excitability of the nervous system is quieted, the action of the heart is reduced, and tissue waste is diminished, while more waste products are excreted. All this contributes to improved metabolism and renewed activity. So that in the conditions occurring in acute disease hypnotics may be essential ; the sleep obtained, although not characterised by benefit to an equal degree to that of natural sleep, yet is often invaluable. In chronic diseases the same temporary need may arise, but the use of hypnotics in the ordinary conditions of chronic disease is rarely attended by anything but evil. Of the injurious effects of hypnotics on the cells of the central nervous system practically nothing is known. Changes in the neuclei of the cells have been described ; they become smaller and more homogenous, and colour more deeply ; but we know not what interpretation to put on this. While we know nothing of the histo-pathologic changes, of the physiological effects there is much known in a general way. I need not stop to detail the injurious effects of morphine, chloral, cocaine and alcohol.

Of the continued use of the bromides, it might be pointed out that in addition to the general cachexia with loss of appetite, disturbed digestion, anæmia, loss of memory, mental apathy, and commencing paralysis and trembling of the extremities that may be developed by their immoderate use, there may occur also marked mental aberration and alarming homicidal tendencies.

Chloralose in three-grain doses has produced alarming collapse in a woman within an hour. Recovery was slow.

Sulphonal.—The administration of this drug is, even in moderate doses, occasionally followed by fatal results. The symptoms set in with abdominal pain and vomiting, scant and usually dark urine,

owing to hæmatophorhyrinuria. Collapse results, soon followed by death. These symptoms may appear suddenly after the patient has been under treatment for some time, and has been benefited by the drug.

These effects have been most frequently met with in women with marked constipation. Owing to the constipation there is probably retention of the sulphonal in the system. But serious results have occurred without the existence of constipation to cause retention of the drug. Eighteen grains daily for three days has caused collapse with pallor, weak rapid pulse, anæmia, diplopia, meiosis, hyperæsthesia, and paresis, the patient being only able to walk with difficulty two weeks later.

In a woman 28 years old, the subject of melancholia and hysteria, 30 grs. given in two doses, one and a quarter hours apart, caused sleep for twelve hours ; then she was aroused. But the somnolence increased, pupils contracted, and in forty hours death occurred suddenly.

Hæmatoporphyrinuria is supposed to be due to gastro-intestinal hæmorrhage. In dogs killed with sulphonal active and passive congestion of the meninges have been found, with, in some cases, hæmorrhages at the floor of the first ventricle.[2]

Marked congestion of the spinal cord and degeneration of the nerve cells of the anterior horns of its lower portion have also been found.[3]

It is evident that greater care is necessary in the administration of the drug than has generally been observed. The laity are coming to look upon it as a safe hypnotic, and many use it without restriction.

Trional.—Its continued use tends to give rise to various disturbances of consciousness, of speech, of hearing, and of vision, to loss of memory and to ataxis of movements in general. There may be involuntary excretions of urine and fæces. To prevent these untoward symptoms its use should be intermitted from time to time.[4]

Paraldehyd.—This is a comparatively safe hypnotic, yet large doses of it have been followed by serious effects. Great dyspnœa and collapse have resulted in a case of chronic bronchitis from one drachm.[5] Somewhat larger doses have caused marked delirium with paresis of the functions generally resembling delirium tremens of alcohol.[6]

The proneness to the formation of a confirmed habit is a strong reason why any hypnotic should be used carefully and with the appreciation of the needs of each individual case. And this propensity to form the drug habit is especially marked in neurasthenics, the very classes from which the cases of insomnia are most largely drawn.

In neurasthenia and in conditions of unstable nervous or psychical equilibrium, whatever develops or creates self-discipline and self-control in the patient is of great value. Such self-discipline is interfered with by hypnotics.

In some conditions the amount of narcotics necessary to induce sleep is so great that it is better to let the patient like awake for two or three nights even than to give such large quantities.

If power of compensation be lost, it cannot be restored by any means other than by lessening the labour and improving the nutrition of the parts that have failed. It would seem eminently unfitting in such a condition to resort to medication that interferes with digestion and assimilation and retards the processes of elimination, when the hope of cure must rest on restoration to a healthy metabolism.

It is wise practice to give hypnotics rarely, and only when other means have failed; then only in the smallest dose necessary to give sleep, being satisfied with the least amount of sleep that is safe.

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When I received the polite invitation of your secretary to present a paper to a section of this Society, I felt that, although I should not be able to prepare an elaborate essay upon the subject, I could not do less than acknowledge the courtesy by an attempt at least to contribute something upon a subject which in our present conditions of civilisation and of work is constantly forcing itself upon the attention of practitioners, and which unless this is a very exceptionally fortunate body among brain-workers, must have not only a professional but a personal interest among a certain proportion of this gathering. Although I have been obliged for nearly six years to take into serious consideration many times almost every day the treatment of insomnia, I may as well confess at the outset that I have not formed any peculiar theory or settled down upon any one pet plan for its treatment.

I do not think that there is any one theory of sleep or the want of it which stands the test of therapeutics, and in fact it would be as absurd to expect such as it would be to look for exactly the same

pathological condition in all cases of paralysis or neuralgia. I can do but little more than give you, in perhaps a somewhat disjointed way, the results of my experience.

Of course the various theories based upon the blood supply of the brain are those which seem to offer the most secure basis for a rational system of therapeutics in this affection, especially the more chronic forms, but I do not know of any one of them all which is thoroughly satisfactory and adequate to explain all the phenomena. That the surface of the cerebral hemispheres is usually in a condition of relative anæmia in normal sleep, and also, as a natural consequence, that other parts of the body and in particular the skin, are apt to contain more than the usual amount of blood, are tolerably well-established facts. But congestion of the brain, although certainly not a condition of normal sleep, produces symptoms not very different from it, and on the other hand, cerebral anæmia, whether as a part of a general anæmia or simply local, gives rise to symptoms just as far from normal sleep as those dependent upon the opposite condition of the blood supply. It is probably just as true in insomnia as in many other visceral states, that the demands of the nervous centres regulate the supply rather than the reverse. In the treatment of insomnia, in the first place a normal and sufficient general nutrition is to be looked out for, as the basis for normal cerebral action, and, secondly, the distribution of the blood should be equalised, with the balance, however, tending rather to anæmia than the reverse, although by no means to the extreme.

The derivation of blood may be accomplished by hot baths to the feet, or the lower half, or even the whole body, emphasized if need be by the addition of a little mustard. The well known expedient of a small amount of easily-digestible food just on going to bed or on waking up in the course of the night, probably acts, to a considerable extent at least, by withdrawing superfluous blood from the brain to the stomach. Massage in the evening is a valuable agency in the same direction.

Another illustration of the same influence is to be found in the intense drowsiness that comes over one who has been exposed to the cold for a considerable time and sits down in a warm room in front of a cheerful fire. Cold feet are often an accompaniment of insomnia, and it is better to promote the circulation in them by alternations of hot and cold water and friction than to simply attempt to warm them by hot external applications.

There seems to be a certain medium degree of activity in the cerebral circulation necessary for normal sleep, and indeed it might

be expected that this would be so. On the one hand, the activity and discharge of nerve force could hardly be prevented, while the neurons are being bathed by a rushing current of highly arterialised blood. On the other, sleep is not simply and solely a condition of exhaustion. It should be a preparation for waking activity and the occasion on which the storage of potential energy for future use must for the most part take place, and of course this cannot be accomplished without a supply of nutriment to the cells.

The promotion of the general nutrition is of great value in the treatment of insomnia, especially of the more chronic forms. Sometimes it is sufficient without the introduction of any more specific measures in restoring the normal function. But people lie awake when the extremities, the skin, the viscera, so far as anyone can judge, are properly supplied with blood, and when everything seems conducive to its proper distribution; everything, that is, except the condition of the brain itself. Either an excitement which cannot be banished or an excitability which makes slight disturbances into great ones, drives away repose, and an active congestion is the result of the too long continued demand upon the brain.

Cases where sleeplessness results from adequate causes—pain or extreme sensory irritations, bright lights, loud noises—are hardly to be reckoned as insomnia at all, but the line which separates the adequate from the trivial varies greatly, according to the individual and in the same person at different times. The psychical element is very distinctly shown in the great diversity of effect produced by disturbances according to the mental attitude of the would-be sleeper. A noise which he considers perfectly legitimate or for which he feels no responsibility, is much less likely to keep him awake than those of another origin, though perhaps the same in quality, like the dog, who, to no purpose, bays the moon or the cough for which the doctor has ineffectually prescribed, and which is constantly reproaching him for his failure. Some cases have been observed where, several of the senses being wanting, stopping up temporarily the channels of the remainder, has resulted in sleep within a few minutes, but it is well known that noises to which one has become accustomed and for which one no longer waits, cease to have any effect in awakening a sound sleeper. In fact, it is their cessation, and not their continuance, which acts as an irritant. It is necessary to bring the the attention to rest.

It is probable that the sensible fatigue of mental labour consists not so much in the actual cerebration, the bringing together of ideas,

as in forcing the work to continue in certain definite directions, without regard to outside distractions.

After a time this becomes more and more difficult, and stronger and stronger irritants are necessary to retain the attention. Thus we have under normal conditions the soothing effect of monotonous repetitions, as of music or a prosy speaker. In normally going to sleep the attention either because too much fatigued to act longer, or failing to receive stimuli from without, ceases to exercise its control in coordinating the intelligence received from the special senses and the various departments of the brain. Cerebration disassociates itself from the recent memory and from the data of sight and hearing and feeling as they are rapidly becoming blunted. Definite thinking becomes dreaming. True insomnia, as distinguished from an interruption of sleep determined by special causes, seems to consist largely in the attention refusing more or less obstinately to surrender its directing and controlling power over the action of the brain. Perhaps the associational centres of Flechsig may, by too long continued and intense activity without rest, get into a condition analogous to that of the motor centres in chores or writer's cramp.

The products of a partially exhausted cerebral activity, which should be allowed to float vague and purposeless, calling for an expenditure of energy much less than the nervous tissue is capable of reacquiring during the same time, are still more or less held together and intensified so that the potential energy of the nerve centres is drained away as rapidly as it can accumulate ; the output exceeds the income, the patient gets little rest, and arises unrefreshed.

It may be remarked, however, that the effect of two or three nights of this form of insomnia is less absolutely and thoroughly exhausting than the same period of enforced wakefulness under great pressure, as, for instance, that of a sentry, a nurse, or an engine driver working overtime, although the latter may occasionally pass into the former, as an acute disease may pass into a chronic.

A purely experimental want of sleep produced by constantly waking the persons experimented on, although to be sure assisted as far as possible by themselves, seems to have produced singularly little disturbance in nervous or cerebral function, and to have been recovered from with an amount of sleep much less than that lost, varying from 16 to 35 per cent. In these cases, however, the mental strain in the form of anxiety or responsibility was almost *nil*, and it is not difficult to understand how the effect upon the reserve supply of nervous force might be correspondingly less. Dogs usually die after four days of wakefulness.

A plan sometimes resorted to in desperation by victims of insomnia of producing great bodily fatigue, as for instance by a walk much beyond the usual habit or ability is an extremely bad one, and usually fails entirely of its object. As with the circulation, a certain medium degree of fatigue is required for the best kind of sleep, and if increasing the burden is to be of any value, it must be shifted so as to fatigue new portions of the brain and not deepen the old ruts from which it is already difficult to dislodge the current of the thoughts.

Reading one's self to sleep, with the very important proviso that the book shall be a suitable one, not too interesting and not in the same direction with the day's anxiety, is a common and commendable device. Probably nothing could be more valuable and efficient, were it generally available than music, which would, however, require a delicacy of adaptation to the individual case that would considerably interfere with its practical applicability. Many might yield to this influence, but many different tunes (and I use the word advisedly) would be required, from the monotonous, crooning acceptable by the restless and uncritical infant to the Träumerei of the accomplished artist, or those mysterious airs played by Volker with his sword fiddle-bow as he kept watch before the resting-place of the doomed Nibelungen:

> Then sounded his strings till all the house rang; softer and sweeter he began to fiddle till flitted forth from him into sleep full many a careworn soul.

The prescription most frequently made for chronic insomnia and undoubtedly in most cases the best, is that of rest or a vacation. Unfortunately both of these recommendations are usually more easily given than taken. Absolute vacancy of mind is talked about but never attained, and relief from mental activity means in reality relief from the habitual current of anxious thought, from care and responsibility, matters which in such cases are apt to be beyond the control of the physician. It is especially difficult to obtain them at home or in the midst of familiar surroundings. A vacation in the country, real country, if it can be realised, is by far the best method of getting the necessary diversion, but here also there is a choice. It is to be remembered that the disturbances of sleep which are the most difficult to manage come from within, and the occupation of the vacation must be such as will displace morbid activities by healthy ones, not intense but sufficient to predominate. If the patient has nothing else to think about he will be sure to think of his troubles. Of course there will be cases where this train of thought is so firmly established that nothing can displace it, but a life in the woods with adventure enough to command the attention of the invalid in an entirely different direction

from the habitual one, is as likely to do so as anything. A well founded doubt as to whether he is going to find any place to sleep at all is a very useful corrigent to the harrowing anxiety as to whether he shall be able to sleep if he gets there too easily.

In cases not insane, the haunting idea which is likely to stand in the way of satisfactory sleep, is the dread that it will not come or the feeling of doubt and expectation when it is awaited. Insomnia and the dread of it re-act upon each other to heighten their intensity. Under ordinary circumstances it is better that all ideas in regard to sleep, even the expectation of it, should be banished from the mind, unless, of course, it be so firmly believed in that the element of doubt no longer exists. "Sleep, like the other gods, comes when we least expect him." When this idea can be banished a great step has been taken. Suggestion, as it is mildly called, not dependent upon hypnotism and varying from the gentlest limits to the most vigorous asseverations, is by no means certain of ridding the patient of this dread, and it must very often be backed up with a dose of something.

Patients, when they are strongly suspicious, or even when it is acknowledged that the medicine ordered will not be a very powerful one, are reluctant to be abandoned to their own resources. They catch at straws like drowning men.

A placebo or half placebo, as some of the mild hypnotics and even some of the others when given in very small doses, may be called, ought always to have a reputation, whether deserved or not, if there is any chance of the name becoming known, lest a highly intelligent patient, as such patients are apt to be, or an officious nurse should look it up in a medical dictionary, which for practical purposes, whatever it may do from a scientific point of view, should give out no uncertain sound.

Hence a part at least of the value of lactucarium, lupulin and hop pillow, and the knowledge that a powder is lying on the chimney piece or that a note has been made in the order book has a tranquillising effect often highly desirable.

A graduated series of powders, with sugar of milk to maintain the bulk and quinine to maintain the taste, beginning with a full dose of sulphonal and ending with none of it, is a convenient method of ridding the patient of the drug habit without the disturbing thought involved in the information that he must get on as best he can without it.

Hypnotics may be roughly divided into two classes: those which permit and those which produce sleep, those which diminish nervous excitability which keeps the patient awake, and those which distinctly though perhaps not profoundly, narcotise the nervous centres.

The most typical of the first class are the bromides, of which I have personally never abandoned my preference for bromide of potassium as decidedly the most powerful, believing that the fear of any depressing effect of the potassium element therein is purely imaginary in any doses likely to be used in the treatment of insomnia.

The bromides are better given in two or three doses during the evening, and, in many chronic cases, through the day, than in a single large one, although in my own person the latter plan works well also.

The bromide of potassium, under circumstances demanding mental activity, even in considerable doses, is not a distinct hypnotic, although when given in the way I have suggested it will frequently allow a patient to sleep if it does not make him do so; and I think the same is true of its corrigent action when given with narcotics that are liable by themselves to exercise an excitant effect, as opium or cannabis indica, which it converts from excitants to sedatives. I have taken a single dose of more than 100 grs. of bromide of potassium for the purpose of having the condition of the retinal circulation examined by one of my ophthalmic colleagues, and then made my hospital visit without any perception of anything unusual in my mental condition or any remarkable degree of somnolence perceptible, so far as I was aware, to others. Yet such a dose in the evening would have given me a very quiet night if undisturbed, and I have no doubt, if I had yielded to it, would have done the same in the daytime.

Opium, the first of narcotics, notwithstanding its undoubted power and the fact that sleep, or something resembling it, usually follows a sufficient dose, is not a trustworthy hypnotic, although Molière attributes to it the mysterious "virtus dormitiva."

It is in small doses uncertain, in many persons having the reverse of the desired effect, and in large ones its disadvantages far outweigh its benefits. I can hardly think of circumstances which would justify its use in a case of pure insomnia.

Cannabis indica is hardly a hypnotic at all when alone, but often acts very well in combination with the bromide. I have used it also with good effects in cases where the dreams were troublesome, with the result, or coincidence, of their changing their character for the better. Chloral, I think, has to a considerable extent gone out of use. I have ceased to use it myself except very rarely in cases where patients believe that a very small dose is sufficient, or where it is necessary to produce a decided effect promptly and surely. I judge from the catalogues of drugs given me by patients that the fear of it is not peculiar to myself.

Of the immense number of other hypnotics, mostly of coal tar

origin, each of which has in turn been brought forward as agreeable, sure and free from danger or disagreeable after-effects, I will only mention two. I do not believe that the hypnotic is yet discovered, or ever will be, which is at once trustworthy as to producing the result desired, and incapable of producing any unpleasant after-effects. Sulphonal, it seems to me, comes as near to this standard as any drug of which I know anything, and, used with care, is little likely to do harm except that which attaches to any habit of the kind and dependence upon artificial aid to sleep. The tardiness and permanency of its action is undoubtedly a consequence of its difficult solubility and slow absorption, and cannot be looked upon as a disadvantage if properly allowed for, since a second good night without a repetition of the dose is by no means an unusual occurrence.

I have found it to fail but rarely when given in the dose of 1 gramme.

I have rarely, if ever, repeated this dose on the same night. In doses of less than 30 centigrammes it may properly be considered a semi-placebo. It should not be given continuously, that is on successive nights, for any length of time, and, if its use has to be continued, the intervals should be even longer than two days.

Trional is more soluble and rapid in its action, but seems to enjoy most of the advantages of sulphonal, except that of acting for two nights.

The peculiarities of each may be best utilised by reserving sulphonal for a patient who has not slept for several nights, and who, it is pretty clear, is not going to get a good night unassisted, so that the medicine may be given early, namely, 6 or 7 P.M., in order that its effect may be developed at about the regular time for going to sleep

Trional, on the other hand, may be kept for a case where sleep is likely to be well begun, but where it is likely to be broken off very early in the night, and not renewed without a hypnotic. The dose may be given at any time in the night necessary.

All hypnotics are of course to be looked upon as makeshifts, and only for temporary reliance; but they, and more especially the recent introductions, make possible the relief of sleeplessness, and as I believe, if judiciously used, without harmful after-effects, or materially postponing the day of the restoration of the normal action.

They enable us to abolish that feeling of dread with which the patient watches for the coming of night, and to promise, with as near an approach to certainty as is ever possible in therapeutics, that he shall sleep.

V.—Professor Charles Richet,

University of Paris.

Professor Charles Richet, speaking in French, said that chloralose ($C^{6}H^{10}CHCl^{3}O$) studied physiologically had the effect of benumbing the brain and stimulating the spinal cord. In a dose of 10 or at most 59 centigrammes it induced and made the cardiac circulation regular and strong. It was therefore distinctly indicated in diseases of the heart, and, as it did not in any way disorder the digestion, in diseases of the stomach. It raised arterial pressure, so that it could not be said that insomnia was due to a cerebral anæmia.

VI.—Donald MacAlister, M.D., F.R.C.P.,

Physician to Addenbrooke Hospital, Lecturer in Medicine, University of Cambridge.

Dr. D. MacAlister, after an appreciative reference to the general surveys contributed by the openers, thought it might be well if each subsequent speaker would give something of his own practical experience for the instruction of his colleagues. He himself had to deal at Cambridge with large numbers of students, many of whom were hard-working, while some worked too hard; and in their case, when examinations were approaching, the addition of anxiety to mental overstrain led to insomnia. The treatment was conditioned by the necessity that nothing should be done which would interfere with mental acuity or memory. He had been driven by this condition to abandon all hypnotic drugs in the regular management of these cases. All tend to confuse the mind; all are liable to be taken habitually. Simple means, such as Benjamin Franklin's air bath—mere walking about the room naked for a few minutes and then slipping between the warm blankets—or lying in a hammock with none but an over-covering, or wearing a nightshirt wrung out of cold water closely wrapped round with a flannel "blazer" or pyjamas, were in the majority of cases adequate. But there were cases where these failed; the patient was literally over-fatigued, too tired to sleep, as Dr. Brunton had said. It was needful not to depress but to stimulate, until what we might call the level of normal fatigue was attained. Dr. Richet's remarks on the peculiar strychnine-like action of chloralose on the cord were of special interest to Dr. MacAlister in this connection, for it bore suggestively on the fact that in these over-tired patients strychnine itself was often of striking value. One-fortieth to one-twentieth of a grain of the hydrochloride at night was followed first by a sense of cheerfulness, and then by normal sleep. A small cup of strong coffee now and then serves the same end. In

women students, who were very prone to ante-examinational insomnia the same general means were generally efficient. The only other drug he regularly used in their case was magnesium sulphate, and an excellent one it was. Of course instances occurred in which the evil lay deeper, cases in which even the examination must be sacrificed that the insomnia may be relieved. He used then one or other of the hypnotics that had already been discussed, preferring the bromides and chloralamide to the rest; but he made it a rule never to *prescribe* them; he gave them to the patient out of his own stock, and the name of the medicine was never mentioned

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VII,—Robert Saundby, M.D., F.R.C.P.,

Physician to the General Hospital, Birmingham.

Dr. Saundby wished to express his agreement with the views expressed by so many speakers in favour of abstinence as far as possible from the use of hypnotic drugs. The treatment of disease should be based upon its etiology, and yet it was when this knowledge failed that the use of hypnotic drugs seemed to begin. Yet, assuming that there are occasions upon which the use of such drugs is necessary, it is better to give drugs of which we know something, and it is difficult, if not impossible, to keep pace with all the novelties introduced into our *Pharmacopœcia*. The most certain hypnotic drugs are chloral and sulphonal, and their danger has been exaggerated. Could it be that some preparations of chloral were impure? Chloral should be combined with tincture of digitalis in equal quantities. It is valuable in the insomnia of enteric fever and in delirium tremens. In the insomnia of dyspepsia, which supervenes two or three hours after retiring to rest, a little bicarhonate of soda and peppermint water to take on waking gives sleep. In his own case the insomnia of overwork had been readily amenable to small doses of bromide at bedtime.

VIII.—Professor A. R. Cushing, M.D.

Professor Cushing mentioned that the chlorine compounds of the fatty series—chloroform, chloral and chloralamide—have been shown to produce fatty degeneration in various organs when given habitually to animals, and asked for information regarding any such effects following the administration of chloralamide and chloralose in man. He thought it not unlikely that the small dose of the latter which was necessary to produce sleep might be given with impunity. The pharmacological effects of pellatine and chloralose resemble those of morphine closely. Animals are thrown into a state of excitement,

and even into convulsions by all three, while in man narcosis follows their administration. It would therefore be of interest to find whether these newer hypnotics resemble morphine in its specific effects on pain.

IX.—Henry Barnes, M.D., Carlisle.

In considering the treatment of insomnia the first question which we should decide to ourselves is this ; " Is the patient really suffering from want of sleep ?" I am accustomed to tell patients when importuned for sleeping draughts that an hour of natural sleep is worth four or five that amount of drug sleep. The absence of sleep is sometimes very distressing and very trying to the patient and to his friends ; and patients are very apt to have delusions as to the amount of sleep which they obtain. They are also very apt to fall into the habit of taking sleeping draughts without due necessity. It has happened to me on several occasions to have my attention called to the frequency with which patients were indulging themselves in sleeping draughts or powders. The morphine habit, the chloral habit, the sulphonal habit is easily set up. In England, where patent medicines containing opium are easily obtained, I have found patients indulging themselves in chlorodyne in extraordinary quantities. I had one patient who informed me that her usual dose of chlorodyne when she could afford it was a 4s. 6d. bottle. This contains 2 ounces and 2 drachms of chlorodyne. I think, therefore, we should be chary in prescribing hypnotics. Some people require more sleep than others. No general rules can be laid down. Nature must decide. Time spent in real sleep cannot be said to be wasted, as sleep is a wonderful restorer of nervous energy. The division of the day by a celebrated English jurist, Sir E. Coke, may be quoted :

> Six hours in sleep, in laws grave study six,
> Four spend in prayer, the rest on nature fix.

In procuring natural sleep the first thing is to remove all sources of anxiety. The want of sleep is certainly most depressing. Little difficulties, which at other times it would be a pleasure to surmount, appear insuperable, but patients should not despair. Sleep may be induced in two ways. We may lessen the flow of blood to the brain, or we may lessen the functional activity of the brain cells. The former object may be accomplished by removing anything which tends to force the blood to flow forcibly through the brain ; by ensuring a sufficient degree of warmth and bodily comfort, by a warm bath at bedtime, and by strict attention to the general health. Insomnia is very common in gouty subjects. We all know how sleep

is sometimes suddenly interrupted in the earlier morning hours oy the acute gouty paroxysm. A similar form of sleeplessness is often dependent on acid or fermentative dyspepsia. According to Duckworth, Cullen was the first to call attention to this. Cullen said, " Persons who labour under a weakness of the stomach, as I have done for a number of years past, know that certain foods, without their being conscious of it, prevent their sleeping. So, I have been awaked a hundred times at two o'clock in the morning when I did not feel any particular impression, but I knew that I had been awakened by an irregular operation of that organ, and I have then recollected what I took at dinner, which was the cause of it." Murchison has described this form of sleeplessness, and attributed it to hepatic derangement, which induced lithæmia and other forms of gout. The insomnia in these cases comes on suddenly. The patient goes to bed apparently quite well, and goes to sleep as usual. Suddenly sleep is interrupted, and there is sometimes nausea and stomach discomfort lasting for two or three hours. I am inclined to think that insomnia has a gouty origin in a larger number of cases than is generally supposed. In these cases simple draughts of hot water, or potash water with sal volatile, give some relief, but attention to diet is very necessary to prevent recurrence, and rhubarb and soda or Gregory's powder at bedtime. Insomnia also sometimes depends, especially in elderly people, on atheroma of the arteries, whereby they lose their contractile power, and they are unable to regulate the flow of blood to the brain. In these cases iodide of potass is useful and the addition of bromide helps to quiet the brain cells. Of the newer hypnotics I rely mainly on paraldehyde, sulphonal and trional. Paraldehyde I consider mainly useful in cardiac cases, and in acute inflammatory conditions of the lungs, also in delirium tremens, in doses of ʒi to ʒiss : sulphonal up to 30-gr. doses and trional 20-gr. doses. Sometimes I use hyoscin, but the best advice I can give patients is to use drugs as little as possible, to be as little in the house and as much out of doors, to take things as easily as possible, and the blessing of sleep will soon return.

X.—A. A. McCallum, M.D.

Dr. McCallum referred to the action of Behring's serum in the non-diphtheric in producing sleep. He mentioned the fact that patients treated by antistreptococcic serum fell into sound sleep. He does not know whether patients sleep from excretory inadequacy or an internal secretion or an arrest of internal secretion.

XI.—Dr. Learned, Northampton, Mass.

Dr. Learned told of a method he had found of inducing sleep in the following words. He said a violent collision with frozen earth, the result of my first ride after a newly purchased horse in 1883, took me out of the busy life of the every day and night practitioners. For many years, instead of experimenting upon a willing and paying class of the laity, I was experimenting upon an unwilling and non-paying member of the profession. I did not sample all the remedies of the profession. I did not sample all the remedies of the dispensatory, if I remember correctly, but I sampled many remedies outside the dispensatory. Hot water, cold water, inside and out : lack of food and surplus of food ; gymnastics in my room, and gymnastics with the wood saw in the basement, in the night time ; brisk walking in the halls and around the square before retiring ; friction direct and indirect ; long deep respirations with and without the numberless mental occupations, as varied as the physical—all these I tried faithfully.

I read about insomnia, its causes and remedies. From my hammock under the tree I looked out upon the doctor's swiftly passing phaeton, and read reports of his marvellous achievements, medical and surgical, in the evening papers. It was during this blank interval, while I waited power to return to me, that I raised the enquiry : Can we devise any means to turn off the belts from this little fragment of brain that insists upon its automatic excursions day and night ? This perpetual motion of a few cells of grey matter, that obstructs rest, and prevents repair of the great whole ? Can we by counteraction set up a motion elsewhere after retiring that will bring an equilibrium of arterial and vital current so that sleep pure and undefiled will come to our relief ?

During this frame of mind I experimented and practised with muscle and will in many and divers ways after retiring. I had the whole bed, length and breadth. I directed various contractions and relaxations, and finally reached the conclusion that a systematised and well-ordered method of muscular and mental activity would soon bring the conditions required—a sense of fatigue that precedes and invites sleep. The recumbent position furnished the best opportunity. Once asleep the point is gained. Who has not been dull and almost asleep before retiring, but wide awake immediately after disrobing and experiencing the gentle shock of the fresh sheets and changed posture ?

Is it necessary to recite here the advantages of proper conditions of atmosphere and temperature of the sleeping room ? I will assume

not; but say that open windows, at all seasons, heat never turned on in my sleeping room, and moderate bed covering has come to be a necessity with me. This is my method.

Lying upon the back, with or without pillow, I reach for the footboard and headboard at the same time. This brings into use many muscles that have not been on active duty during the day. I now raise the head half an inch, enough to realise it has more weight than I had before supposed. At the same time, by will power, I direct the respiratory process to a slower and deeper movement. I order about six or eight inspirations, deep and full, in place of sixteen per minute. Every inspiration is recorded, counted. Thus the process begins of inviting two forces into new channels, and relieving the old. At the expiration of ten to twenty inspirations the head has become so heavy you want to drop it. This you do. Immediately the right foot is raised a half inch from its resting-place. The reach for the footboard and headboard continues; the count of slow, deep inspirations continues; the sense of fatigue of muscles engaged in lifting the foot and holding up the coverings continues. Here as before, the foot, like the head, has become a dead weight, and must go down. Now, immediately the left foot is elevated with all the previous conditions remaining. The reach downward and upward of foot and head is kept up, so far as power will permit without exhaustion. This foot remains up for the same length of time, the respirations being the clock work. It goes down. You may now relieve the reach for foot and headboard and use the muscles to elevate the trunk, holding it by resting upon heels and head and shoulders. This elevation of the central part of the body and rest upon the two extremes will call for change, as all the former positions have done. By the same clock you have the time marked off, and the body is again flat upon the back, waiting new orders.

Turn now to the right side, reaching for head and footboard as before, and elevate the head half an inch by use of lateral muscles of neck and chest. At the expiration of time the head goes down and foot goes up, by use of lateral muscles. Change now to left side, and repeat what has just been accomplished by the muscles of the opposite side.

You have now assumed eight positions, and used a large majority of the whole number of muscles in carrying out your dictations. If you have not fallen asleep before this cycle is completed, you may begin again and go over the same round. If you have already gone to sleep you will not be required to.

Other methods of procedure would answer the same purpose un-

doubtedly, with the respirations guarded and uniformity observed, mind and muscle constantly occupied. There should be no periods of rest, no vacations. Thus fatigue comes inevitably, and sleep follows. I know of no means so ready, so much at command, any time and anywhere, so inexpensive and so absolutely certain as this routine of mental and muscular exercise to induce sleep. It involves a principle. Following it sleep appears to be inevitable. There is but one drawback: it requires some exertion—continuous mental and muscular exertion. The indolent will find it unattractive.

Some conditions of heart or nerve centre may contra-indicate altogether this method. The length of time employed in the several positions will vary according to the make-up of the individual. No one rule can apply to the robust and the exhausted as to the time spent in a given exercise, only that which measures the power of endurance. It is the sense of general weariness following persistent effort that brings the desired result.

Lying supinely upon your back on a bed of comfort it is not surprising that some part of the brain should take a little spin over its accustomed playground. Gentle means of coaxing will not suffice to call it away. Turn off the belt, however, here, and put it on at another point, you inevitably control the situation.

XII.—J. A. Campbell, M.D.,

Medical Superintendent, Garlands Asylum, Carlisle.

I shall condense my remarks as far as possible, and shall speak first of insomnia in the insane, second in the nominally sane. I have naturally been interested in this subject, as insomnia is a distressing feature in several forms of insanity. In the *Journal of Mental Science*, 1873, I contributed an article giving the results of observations I made with the tincture of hyoscyamus, potassium bromide, and chloral in maniacal excitement and insomnia. I found, as all now know, that chloral was the most certain sleep producer, and that potassium bromide was not a powerful enough hypnotic to compel sleep when great insomnia exists. In the *Lancet*, August 2nd, 1879, I published a summary of the results of my practice for the five years ending 1878. I found that during that period I gave a sleep producer to 101 cases, and had a note made of when the patient became quiet and slept. I almost entirely used chloral, and at that time thought highly of its certainty of action and harmlessness when given for short periods. When first introduced chloral was given in too large doses and for too long periods. In summing up my results

I said "that in acutely excited cases where exercise does not cause sleep at night, it is well to induce it artificially so as to prevent injury to health from exhaustion, but this form of treatment should only be used for short periods, even in the distressing insomnia so often persistent in melancholia." In the *Lancet* of March, 1883, I gave a summary of four years' treatment at Garlands. In 1879 I only treated 210 patients for insomnia, in 1880, 11, in 1881, 8, and in 1890, only 3. In this period, for a limited number of nights, sleep was artificially produced, and in all but two cases chloral was the drug used. Of late years I have not found it so necessary to use drugs as sleep producers, and for a considerable time paraldehyde has mainly been the sleep producer used at Garlands. This diminution in the calls for medicinal sleep production I attribute to increased outdoor exercise and greater attention to the suitable dieting of patients.

If architects would devote more attention to deafening asylums, fewer sleep producers would be used. One noisy patient often keeps many awake, and in asylums hypnotics have at times to be given to one patient for the good of others, but a few days' exercise in the open air soon does away with much necessity for drug-produced sleep.

Now just a line or two about insomnia in the sane. I believe that with those sufficiently well off to bear the cost of change of location, occupation and usual habits, and who are not in feeble health, in search of a lost power of sleeping, insomnia can be speedily and surely treated without the exhibition of drugs. Rising early, diminishing consumption of animal food, spending the day in the open air in suitable sports, trying the effect of mountain air or sea air, taking one's principal meals in the early part of the day, never having a loaded intestine, and carefully avoiding having snatches of sleep during the day will in a very short time make most people sleep, and sleep soundly. Though not of a sleepy nature, sea air or mountain air combined with exercise makes me sleep nearly the round of the clock.

XIII.—Dr. W. S. Muir.

Dr. Muir deplored the multiplicity of literature and drugs that are thrust upon the younger practitioners, as the older practitioners soon learn that the medicines and drugs simmer down to a few. He thought every medical man who practises conscientiously will before prescribing for his patient make a thorough investigation of his case, particularly examining into the condition of his stomach and kidneys; many cases of insomnia do not find their first resting-place in the asylum, but are in a manner due to a want of careful study of the case and an honourable treatment thereof; every case requires its own

special treatment, and for a doctor to say that he uses this or that drug in insomnia is absurd. He stated that hydrate of chloral is by far in his hands the surest, but not by any means the safest, hypnotic. Many accidents occur from its use, but in many instances are traceable to negligence. He did not think that we should prescribe it in larger quantities than in two doses of 20 grs. each, that is, when the doctor leaves his medicines and trusts to an uneducated nurse. In the treatment of delirium tremens especially it should be combined with digitalis. Bromide of potassium still is by far the surest and safest hypnotic. Paraldehyde in the insomnia of typhoid has in his hands been the safest and surest hypnotic, as it has a double action; its only objection, so far as he has personally observed, is its abominable odour. Urethane, hypnone, and chloralamin still have their places among the fashionable drugs. Sulphonal and trional are by far the most commonly used drugs in the treatment of insomnia at the present hour. Still, it should be remembered that they are both not devoid of danger. Cases where the untoward effects of both have shown themselves are not infrequent. The speakers preceding him, he said, must remember that the toleration of drugs in the insane is much greater, and that one cannot in private practice use hypnotics, especially with such a free hand. Bromide of hyoscyine is one of the best and surest hypnotics used hypodermically; still, it must be remembered that it has its idiosyncrasies. He has lately had much benefit from the sulphate of duboisin. Its action is very similar to that of hyoscin, dilating the pupils and producing dryness of the throat. Still he thinks it the safer of the two, and he has yet to learn of any accidents following its use. In conclusion he said that every conscientious practitioner should, before resorting to the use of hypnotics for the cure of insomnia, tax his own resources to the utmost and abstain from the use of drugs until he is actually compelled to do so.

XIV.—J. O. Brookhouse, M.D.

Physician to the General Hospital, Nottingham.

Dr. Brookhouse, of Nottingham, was glad to find from the discussion that the treatment of insomnia was not to be dissociated from its etiology. Treatment of disease is not an abstract thing, it is closely relative. Take a patient with chronic Bright's disease, his blood is drained of its most important constituent; his vessels, the larger ones, atheramatous; his capillaries undergoing a fibroid change become are anæmic; his brain is anæmic, and as the outcome of these conditions he is sleepless. Another patient comes before you having so far as you can discern no organic disease, but he has suffered anxiety, business cares

and worries, grief, or other depressing emotions, and as the outcome he is sleepless. The contrast here is sharply defined, and treatment suitable and proper in the latter case would be positively harmful in the former. Before referring to the use of drugs, he would say that in many cases they are not indicated and much better not employed. We may advance any theory we please as to the causes of sleep on the one hand or insomnia on the other, but inasmuch as we have no definite basis we are in the safe position of running little risk of contradiction, which has its advantages. I am glad to find the tendency of medical thought is not to treat insomnia by drugs, but rather by change of scene, fresh air (mountain air if possible), moral help, regulated exercise, and a suitable diet, not forgetting in this latter relationship that those who cannot sleep cannot properly digest. I call this natural treatment of disease, and believe it to be the best. If, however, recourse be had to drugs I think a combination of morphia, chloral, and sodium bromide the best. Of the newer remedies I will not speak in detail, but of their use in general I am not favourably impressed.

XV.—W. Whitla, M.D.,
Professor of Materia Medica, Queen's College, Belfast.

Professor Whitla expressed the very great pleasure which he had experienced in listening to the discussion. A discussion conducted upon such lines would have been an impossibility twenty-five years ago. The total absence of the old empiric spirit was a most marked feature in the debate, and the absolute unanimity of all the speakers upon the main question that hypnotics should only be resorted to when all other measures failed. He went into the relative merits of various hypnotics, and emphasised the dangers of chloral as above the dangers of all the rest put together. He dwelt upon the importance of remembering the habit danger as well as the life danger, and chloral stood at the top of the list in both respects. He reviewed the qualities of alcohol, praising its certainty and freedom from immediate danger to life, but emphasising its habit danger ; but for the latter he thought it the best of all hypnotics. The dangers of chloral were greatly exaggerated and it should not be forgotten that it had been used many millions of times, and it was fallacious to compare the published results of the drug with those of rarely employed hypnotics. He detailed a peculiar form of insomnia which occurred in patients who went to bed, fell asleep in a few moments, and awoke again in a few seconds. These patients he had noticed were broad shouldered men, and the symptoms were caused by the pillow difficulty. He recommended the German wedge-shaped pillow as a specific in that form.

XVI.—Andrew H. Smith, M.D., New York.

Dr. A. H. Smith stated that 20 grs. of powdered capsicum given in one dose in the form of a bolus will very generally produce sleep very promptly in cases of delirium tremens. This is a practice handed down by the medical officers of the old United States army. It has no disagreeable after-effect until the next defæcation, when there is apt to be a momentary check in the patient's enthusiasm over the otherwise admirable action of the drug. He has introduced this method into his hospital practice, and the results are very satisfactory.

XVII.—G. A. Atkinson, M.D., Newcastle-on-Tyne, England.

Dr. Atkinson pointed out how errors of refraction, especially in neurasthenic patients, cause mental irritation and headache when reading at night, and so lead to insomnia. Further, in aged persons to whom opium or its preparations have been given, and in whom there is a defective arterial supply to the brain, preparations of beef-tea, or tea or coffee, will act well and largely if not entirely replace the drug.

XVIII.—D. J. Leech, M.D., F.R.C.P.,

Professor of Materia Medica and Therapeutics, Victoria University, Manchester.

Dr. Leech said that a marked feature in the discussion which had taken place was the agreement of all the speakers as to the necessity for avoiding, as far as possible, the use of drugs in the treatment of insomnia, and of trying to produce sleep by removing the causes of wakefulness, and the adoption of what might be called general treatment. Whilst fully agreeing with these views, he nevertheless thought that in a considerable number of cases the use of drugs could not be avoided. In young adults, as Dr. MacAlister had pointed out, drugs were rarely necessary for simple insomnia. But in a class of people coming under the care of the speaker, he looked upon hypnotics as an important aid to treatment. He alluded to middle-aged people with gouty and neurotic tendencies, immersed in business more or less, and over-worked. Here, of course, it was always necessary to attend to the secretions in the first place, and remove, as far as possible, the causes of insomnia People of this class nearly always had a bad habit of carrying with them to bed the cares of the day, and they usually suffered from a special form of sleeplessness. The mind continued active, but in a useless kind of way—thoughts being often somewhat disconnected and useless, notwithstanding they led to restlessness. Sometimes, instead of this seeming mental activity

there was simple wakefulness, and not actual restlessness. Now in the wakefulness of the first kind, bromides in 20-gr. doses each night, or oftener, were advantageously combined with general treatment. In simple wakefulness, sulphonal in 10-gr. doses, or chloral in 15 to 20-gr. doses might be taken with advantage for a week or two. In restless wakefulness the bromides, in doses of 20 grs. were most beneficial. He did not believe that he had seen any harm from such use of bromides, although from the large doses mentioned by one of the speakers, grave evils might arise. With regard to chloral, it did not seem that harm was done in properly selected cases, and it seemed to him that the dangers of the careful administration of hypnotics had been somewhat exaggerated. In a second class, the highly nervous, evils might more easily arise, and chloral was a drug which should, if possible, be avoided, and which should not be prescribed so that the patient could get the medicine renewed, and thus take it to excess Even in these cases a soporific was at times required, and paraldehyde was perhaps the best. It is true a paraldehyde habit might be acquired, but then it could not be acquired secretly; a paraldehyde taken could be scented from afar. Sulphonal was only objectionable from the ease with which it might be continuously taken without the fact being known. In a third and most trying class of cases soporifics were rarely of more than temporary benefit, and often a grave evil. Many men—and medical men with especial frequency—suffered from almost continuous insomnia, without any special cause, such as disordered secretion or overwork being present. In not a few the sleeplessness had commenced with overwork, but continued even when this had been given up. Such insomnia often lasted years, and was a source of extreme suffering. All soporifics in turn gave relief temporarily, and in these cases not infrequently a bad habit of taking soporifics to excess is acquired. Chloral, sulphonal, and even trional might thus be used in excess, to the detriment of the patient's health. In such cases a long change of surroundings was the only cure—a life for some time under new conditions, as, for example, in the backwoods, was desirable. Soporifics were dangerous unless in the case of patients gifted with more than usual control. A voyage was sometimes prescribed, but this had one danger—if the sleeplessness was at all associated with melancholic tendency—the temptation to suicide, if the proposed relief from the voyage were not quickly obtained. Dr. Leech concluded by congratulating the Section on the success which had attended the first day's discussion.

REMARKS ON BRAIN TUMOURS AND THEIR REMOVAL.

WITH A RECORD OF EIGHTY CASES AND FIFTEEN OPERATIONS.

BY

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There are few subjects in the field of medicine which excite more universal interest than cerebral surgery. It appeals to general practitioners, to neurologists, to ophthalmologists, and otologists, and particularly to the surgeons; for it offers a reasonable hope of successful treatment in a class of diseases hitherto considered uniformly fatal.

It is impossible in a single paper to deal with the many forms of disease of the brain in which surgical treatment is applicable. I have selected the subject of brain tumours because it is in this field that the most brilliant results have been attained; and I believe that if these results are more widely appreciated, many cases will be discovered in which operative interference is clearly indicated.

The first operation for brain tumour was recorded by Bennett and Godlee in London in 1885, though Macewen, of Glasgow, had successfully removed a tumour (subsequently reported) in 1879. The chief impetus to brain surgery was given by the discussion of this subject before the British Medical Association in 1888, and I think we may proudly claim that in this field of work British and American surgeons and physicians have fairly led the world. Germany and France have been behind even the Australian colonies in this respect, though now at last their interest is enlisted. Within the past ten years medical journals everywhere have contained records of cases, and it is from these records as well as from a personal experience of 80 cases of brain tumour that the facts I am now to present to you have been gathered.

1. The frequency of brain tumours can only be ascertained by a study of pathological records. From Table I it will be seen that at hospital necropsies a brain tumour is found in about one out of every hundred subjects. It is only from statistics of large dispensaries that any estimate can be made of the frequency of brain tumours in practice. Byrom Bramwell has found 82 cases among 10,115 patients. I have seen 80 cases among 16,361 patients. It is evidently difficult to determine therefore the frequency of the disease, the hospital statistics being as misleading in one direction as the dispensary statistics are in the other.

TABLE I.

At the New York Hospital 30 brain tumours were found in 2,970 necropsies.
At the Presbyterian Hospital 7 brain tumours were found in 745 necropsies.
Beadles reports 45 tumours in 4,000 necropsies at one of the insane asylums in England.
Beck reports 50 tumours in 6,177 necropsies at Heidelburg.

2. The diagnosis of brain tumour is in the majority of the cases a matter of little difficulty, yet every year cases are observed and reported in which it has been impossible. The simultaneous existence of headache, severe and persistent, of vertigo and tinnitus aurium, of vomiting, of optic neuritis or atrophy, and of general convulsions point directly to a brain tumour. When that tumour is located in the well-known motor or sensory or speech areas of the cortex, or in the course of their tracts, there are clear indications of its position. It is a very encouraging fact that the parts of the brain in which tumours cause marked local symptoms are the very parts which are open to the surgeon for exploration. There is no more brilliant proof of the value of physiological investigation than the present use to which the doctrines of cerebral localisation worked out by Fritsch and Hitzig, by Ferrier, by Munk, and by Horsley by methods of vivisection have been put. These facts are so easily comprehended that the general practitioner can reach a local diagnosis of brain tumour as readily as the neurologist. For, as Keen has said, the various parts of the brain are as distinct in their function as the various organs of the abdomen, and disturbance in function causes usually definite symptoms.

The chief localising signs of brain disease are spasms and paralysis, disturbances of speech and of sight. A localised spasm, associated with numbness beginning in one limb and extending to others in a definite sequence, and usually followed by a temporary paralysis known as Jacksonian epilepsy, and differing from ordinary epilepsy in the fact that consciousness is not lost, is the most important of all local symptoms. It points to the motor area of the cortex, about the fissure of Rolando, as the site of the lesion, an area easily accessible at operation. It is interesting to learn that it has proved the guide to the surgeon in over 100 of the cases already operated upon, and is the most reliable guide which we have.

Disturbances of speech either in the form of sudden temporary suspension or progressive loss of the power of expression, or of the power of understanding words heard or seen, is the next most frequent local sign of brain disease; and as the speech areas, motor and sensory, in the third frontal and first temporal regions are quite definitely located, such disturbances may also guide the surgeon in his search The loss of vision in one half of the visual fields, hemianopsia, is

another important symptom showing disease in the occipital lobe. Thus definite signs are to be expected in brain tumours in about two-thirds of the accessible region of the cerebral cortex.

The diagnosis of brain tumour lying in the cerebellum is equally easy on account of the characteristic staggering and the very usual development of cranial nerve symptoms. The cerebellum is an organ so deeply situated and so hard to reach, except in the small fraction, hardly one-tenth of its surface lying under the occipital bone, that operations upon it are attended with less success, and are always exploratory. Thus in 34 attempts to remove tumours from the cerebellum but 19 were successful, and but 10 of the patients lived and recovered from the operation. Cases which do not present very clear localising symptoms are, of course, beyond the range of surgical treatment. Among 80 cases of which I have records it was possible to locate the tumour in 65 cases; 26 were cerebellar, 14 were in the motor region, 10 were in the basal ganglia, 7 were frontal, 4 were parietal, 4 in the pons, 1 in the occipital lobe.

3. The proportion of tumours open to operation: It being evident, therefore, that surgical treatment may be successful in cases of brain tumour in which the diagnosis can be made, the question at once arises what proportion of tumours are open to operation. This question can be decided in several ways. It is possible to review the pathological records and to estimate the percentage of tumours which might have been removed. This method has been pursued by many authors since Hale White first made his estimate from the records of 100 tumours examined in Guy's Hospital.

TABLE II.—*Proportion of Tumours found post mortem which might have been removed.*

Author.	Reference.	No. Tumours.	Operable.
Mills and Lloyd	Pepper's *System of Med.*, 1886, vol. v.	100	10
Hale White	*Guy's Hosp. Rep.* 1888	100	10
Starr (children)	*Medical News*, January 12th 1889	300	16
Knapp	*Intracranial Growths*, 1891	40	2
Gray	*Sajous Annual*, 1891 and 1892	102	10
Seydel	*Verhandl. Deut. Gesell. f. Chir.*, 1892.	100	3
Dana	*Trans. N.Y. Acad. Med.* 1893	29	5
Starr (adults)	*Brain Surgery*, 1893	300	21
Byrom Bramwell	*Edin. Med. Jour.* June, 1894	22	5
Oppenheim	*Die Geschwultze der Gehirns*, 1896	23	1
Bruns	*Gehirn tumoren Encyclo. Jrhrk.*, 1896	33	3
Starr	Personal cases	12	2
Total		1,161	88

In Table II the results are shown: 88 tumours out of 1,161 might have been successfully diagnosticated and removed—7 per cent.

Another method of estimation is to study cases clinically and determine in what per cent. a satisfactory diagnosis can be reached and an operation recommended. If we take the records of clinics, we find here a considerable variation of opinion. Thus, Bramwell states that, out of the 82 tumours which he has studied, 5 could be recommended for operation, and in two of these its success would have been doubtful. Of these cases, 22 were studied *post mortem*, and of these, 5 could have been operated upon had a diagnosis been possible, which was the case in 1 only. My own records are as follows:

Of the 80 cases which I have seen, I could recommend an operation in 18, because it was possible to locate the tumour accurately in these cases in a place supposedly accessible to the surgeon. Of these 18 cases, 15 have been operated upon. In 9 the tumour was found where it had been diagnosticated, and in all but 1 it could be removed; in that 1 case it was too extensive and too vascular to be excised. In 6 the tumour was not found; 5 of these cases were tumour of the cerebellum, and the necropsy showed the tumours to have been inaccessible as they lay on the anterior surface far from the bone. This experience has been duplicated by almost every surgeon who has attempted to remove cerebellar tumours. In the sixth case the symptoms of aphasia and hemiplegia which led to the diagnosis of a tumour in the third frontal and adjacent anterior central convolution were due to pressure from a distance. The tumour was found at the necropsy deep in the apex of the temporal lobe and Island of Reil.

I cannot but believe that the estimate made by pathologists that only 7 per cent. of tumours are removable is too small a one, and that with more careful clinical examinations the proportion will be greatly increased. In 1889 I showed that among 600 tumours taken at random from the records, 164 lay in a position to be accessible to the surgeon, while 46 could have been diagnosticated and 37 successfully removed. It is not impossible that at the present day a larger percentage might be successfully located, symptoms being studied by modern methods. It is safe to say that 1 tumour in 10 is open to surgical treatment.

4. The result of operations—Granting, then, that surgical success is to be anticipated in a certain proportion of brain tumours, let us now consider the results thus far attained. I have succeeded in finding records of 220 operations for brain tumour since Bennett and Godlee's original report. Before approaching the statistical results of these cases, be it remembered, that this is a novel operation, attended by many unforeseen contingencies, and that experience is essential to success. After my own experience in the direction of the removal of

15 tumours, supplemented by that derived from 16 brain abscesses, and about 40 cases of epilepsy, for which trephining has been done, I must confess that every operation offers some new point of instruction, and I can support the dictum of Keen that this is not an operation to be rashly undertaken by the novice in surgery. Statistics show that the greatest success has been reached by the surgeons whose experience in this field is the widest. Hence I believe that, as experience brings knowledge, future statistics will show results even more favourable than these which I present.

TABLE III.—*Operation for Brain Tumour.*

		Cerebral.	Cerebellar.
Total number of operations	220	186	34
Tumours found and removed	140	121	19
Tumours found but not removed	7	5	2
Tumours not found	73	60	13

In a few cases the site of the tumour, its vascular character, or the sudden collapse of the patient from hæmorrhage or shock has prevented the removal of a tumour which was found. In some of the cases in which the tumour was not found there has been a manifest lack of indication for the operation from the symptoms, and greater care in diagnosis would have arrested hasty action. In other cases the symptoms were clearly misleading in character. Thus some cases found at necropsy to be subcortical or basal tumours have given rise to symptoms of Jacksonian epilepsy so typical as to lead to the diagnosis of a cortical disease. The differentiation of subcortical from cortical tumours is the hardest problem presented to the neurologist, and is in many cases as yet impossible to solve. Cerebellar tumours are more frequently missed at the operation than cerebral tumours.

Turning now to the successful cases in which the tumour was found and removed, 140 in number, I find that 6 were frontal, 99 were about the Rolandic fissure in the motor area, 6 were parietal, 3 were occipital, 19 were cerebellar. The preponderance of tumours in the central convolutions is owing to the fact that here the diagnosis is, as a rule, quite easy, and this part of the brain is most accessible. As Bruns has aptly said : " The tumours, which are most easily diagnosticated, are the ones which are the most easily reached."

But successful removal is not always followed by recovery. I find that out of the 140 cases, 92 recovered from the effects of the operation, so that its primary result was satisfactory, and 48 died. This is

a mortality of 30 per cent. Death has been due to shock (which is now prevented by dividing the operation into two stages on different days), or to hæmorrhage (the arrest of which is less difficult than formerly because of the many ingenious devices), or to sepsis (which can now be obviated). Hence there is a reasonable hope that this mortality will be diminished in the near future.

5. The question of ultimate recovery and restoration to health is the one of the most interest, and only recently could this be answered with any precision. I cannot offer precise statistics here, for many cases have been reported as cured within two or three months of the operation. But I know that such reliable surgeons as Macewen, Horsley, Durante, Keen, and Weir, have recorded cases as living and in good health from six to eight years subsequent to the operation. One of my own cases is in perfect health, now fifteen months after Keen removed a tumour the size of a large hen's egg from the frontal lobe, and has recovered his vision, which had been lost before the tumour was taken out. These cases, were there no others, are sufficient to warrant the statement that in every case of brain tumour careful consideration of the possibility of surgical interference is imperative.

The character of tumour removable is of some interest, and determines the prognosis in any case. The following table shows the varieties of tumour removed and the results :

TABLE IV.

Variety of Tumour.	Recovered.	Died.
Sarcoma	26	12
Glioma	10	8
Gliosarcoma	7	2
Tubercle	11	8
Cystic	10	8
Angioma	4	0
Gumma	4	3
Fibroma	3	1
Endothelioma	2	1

It is evident that the prognosis is best in hard encapsulated tumours, and that the greatest mortality is in cases of infiltrated glioma, or in cystic tumours, which are frequently the result of degenerated gliomatous tissue. The prognosis is also serious in tuberculous cases, because of the liability to a tuberculous meningitis developing after the operation, or to the existence of multiple tumours.

It is manifestly impossible to determine prior to an operation whether the conditions present are such as to lead to a hope of success, hence every operation for brain tumour must be regarded as

exploratory and as open to many unforeseen difficulties, which may prevent a successful result. This, however, should not be regarded as a contra-indication to operation.

6. Remarks regarding the operation : While the technique of an operation is a matter largely for the surgeon to determine, I venture to state from a study of many cases, and from the careful observation of the methods of many different surgeons, that I prefer the flap operation of Wagner, in which a horseshoe-shaped incision is chiselled through the bone, scalp and bone being reflected together, thus exposing a very large surface of the brain at the outset, and preserving an adequate protection to the brain subsequent to the operation. The hæmorrhage from the scalp is best controlled by pressure applied by the fingers of assistants during the incision, and a rapid clamping of the vessels by the operator as this pressure is removed. Attempts at compression of the blood vessels by a band about the head, or by insertion of long needles through the scalp, or by ligature passed beneath the scalp and tied or tightened about needles, appear to me to involve waste of time and to offer no advantage in point of saving of blood over the other method. In cutting the skull the line of incision is to be first traced with a sharp gouge, and then completed by a chisel ; and it is better to chisel through the skull at an angle of 45 degrees to its surface than to chisel through vertically. In prying up the bony flap, which is to be done by pressure exerted at three points rather than at one or two, it is necessary to proceed gradually, and, in reflecting the skull, to be aware of the danger of a jagged edge of bone at the point of fracture being thrust into the dura or tearing a large dural vessel. The question of suspending the operation at this stage of the proceedings and completing it upon a second day is an open case ; but inasmuch as experience has shown that such an exposure of the brain can be accomplished within fifteen minutes without difficulty, while a correspondingly large opening produced by trephining at two or three different points and removal of the bone by means of rongeurs requires a greater time, it has rarely seemed to be necessary to delay the completion of the operation in my experience. The incision of the dura should be semicircular, following the incision in the skull, but not nearer than $\frac{1}{4}$ inch to that incision, as the dura is apt to retract, after cutting, and thus to disappear beneath the edge of the opening. The treatment of the brain itself depends largely upon the conditions met with at the time of the operation. Some tumours can be easily shelled out from a capsule and the cavity packed with iodoform gauze. Others have to be incised in order to be removed, and it is better to take out a tumour in sections than to delay the

operation by an enlargement of the original opening. In case of gliosarcoma infiltrating the brain, no complete removal is possible, and severe hæmorrhrge is liable to be met with which may even prevent a completion of the operation. It is not dangerous to incise the brain substance, and in such a case, if anything is done in the way of removal of the tumour, it is better to cut through the brain at the border line of the tumour in the hope of preventing its further extension. Bramann has excised portions of a glioma on three occasions from the same patient at intervals of a year. The hæmorrhage from a glioma is sometimes very alarming ; and, if it is impossible to tie the delicate vessels with catgut and the actual cautery does not arrest the hæmorrhage, the only means possible is the packing of the wound with iodoform gauze.

In case the tumour is not evident at the opening, puncturing in various directions with a large aspirating needle is legitimate, and if cysts are found or resistance is met with, it is right to incise the convolution at its summit, and thus reach and remove the subcortical tumour. This has now been done successfully in a number of cases. In case a cyst is met with it is not sufficient to merely empty it or to exsect a small portion of its wall, for the cavity will surely fill again with fluid unless it heals from the bottom ; therefore an extensive dissection of the wall of a cyst is necessary, its packing with iodoform gauze, and the slow removal of this gauze as the cavity fills up with granulating tissue. It is my experience that the prognosis of cysts is by no means as favourable as that of other tumours. In uncomplicated cases it is possible to remove the packing of gauze on the second or third day, or if there has been no reason for packing the wound, to remove the rubber tissue which is used as a drain, and thus secure rapid healing. In a number of cases, however, subsequent to the operation, within twenty-four or forty-eight hours, the appearance of symptoms of pressure may indicate the occurrence of secondary hæmorrhage, under which circumstance it is necessary to open the wound again and wash it out thoroughly. This should not be neglected, as in several cases under these conditions very large clots have been found and removed to the subsequent benefit of patients.

Record of Personal Cases Operated Upon.

Case I.—M., 40. General symptoms: Headache, forehead and top, on left side; nausea, hebetude, stupidity, optic neuritis, slowness in use of words, imperfect control of sphincters. Local symptoms; Tenderness over left frontal region near top, one convulsion beginning with head turned to right, followed by right hemiparesis lasting two weeks, and returning after one year; slow speech, spasms after two

years in right leg or arm. Duration of symptoms: Two years of gradual increase since the convulsion up to time of diagnosis. (1) Diagnosis: (1) Tumour in posterior part of second frontal gyrus on left side, possible gumma; no improvement on specific treatment after six months. (2) Tumour for operation. Operation by Dr. McBurney, June 23rd, 1892. Trephined over tender area; tumour found in 1 and 2 F. gyri; $2\frac{1}{2}$ by $1\frac{3}{4}$ by $1\frac{1}{2}$ inches; removed completely; sarcoma. Result: Death from hæmorrhage and shock eight hours after operation. Reported: *American Journal Medical Science*, 1893, April.

Case II.—M., 42. General symptoms: General convulsions at intervals for seven years; optic nerve pallor. Local symptoms: Numbness and spasms of right hand and arm, extending to face and leg followed by weakness; several daily for five years; partial right hemiplegia with slow hesitating speech: increased knee-jerk on right side; slight anæsthesia of right hand. Duration of symptoms: Seven years of gradual increase up to time of diagnosis. Diagnosis: Tumour or clot, with scar in left anterior central gyrus. Operation: Dr McBurney, November 5th, 1894. Bone flap chiselled over middle motor area. Infiltrating vascular glioma through the anterior and posterior central convolutions; impossible to remove it on account of hæmorrhage. Result: Death from shock and hæmorrhage twenty-four hours after operation. Reported: *New York Medical Record*, February 1st, 1896, in abstract.

Case III.—M., 40. General Symptoms: Headache, vomiting, vertigo, optic neuritis, double vision, blindness, boulimia. Local symptoms: Spasms beginning in left hand, extending to leg, followed by weakness and hemiplegia; no anæsthesia. Optic neuritis worse in right eye. Duration of symptoms: Duration of general and local symptoms one year; under specific treatment six months. Diagnosis: Tumour in central region, right side. Operation by Dr. McBurney, October, 22nd, 1895. Bone flap chiselled over right middle motor area; nothing found. Result: Death from exhaustion two weeks after operation. Necropsy: Large sarcoma in basal ganglia and centrum ovale on right side, under area exposed at operation.

Case IV.—M., 21. General symptoms: Headache, left parietal region; mental excitement with maniacal attacks and amnesia; mental weakness. Local symptoms; Tenderness of parietal bone at point of an old fracture; depressed bone. Duration of symptoms: Five years of attacks, increasing in frequency. Diagnosis: Depressed fracture with pressure on brain. Operation by Dr. McCosh, February 10th, 1894: Trephined; no depression; angioma lying on surface of superior parietal lobule removed. Result: Recovery; loss of muscu-

lar sense in right hand for three weeks, gradually subsiding; fits of mania recurred three years later without headache. Reported: *American Journal Medical Sciences,* November, 1894.

Case V.—F., 27. General symptoms: Headache, optic neuritis, left eye blind, vomiting, exophthalmos. Local symptoms: Spasms in right foot followed by weakness and numbness every two weeks; ataxia of right hand; paresis of right foot; increased knee-jerk, right $>$ 1; tenderness over left parietal region and pressure caused twitching of right leg and feeling of defect in skull. Duration of symptoms: Two years of local spasms; six months blind; three months paretic in leg. Diagnosis: Tumour in upper left motor area. Operation: Dr. McBurney, June 10th, 1896. Defect in skull found and enlarged about a soft tumour lying on the dura. This was removed. On exposing brain a second large tumour was found and removed, $2\frac{1}{2}$ by 2 by 2 inches, adherent to brain, only partly encapsulated; glio-sarcoma. Result: Death from hæmorrhage due to laceration of longitudinal sinus six hours after operation. Reported: *American Neurological Association,* 1897.

Case VI.—M., 22. General symptoms: Headache and tenderness of the head following a blow on the right upper frontal regions Local symptoms: Fracture, with depression at junction of fronto-parietal bones, upper part. Spasms beginning with turning of head and eyes to the left, and spasms of left arm. Duration of symptoms: Spasms for six years. Diagnosis: Depressed fracture; possible cystic tumour. Operation by Dr. McBurney, January 31st, 1895. Trephined, and the opening enlarged by rongeur. Cyst under the thickened dura, with fibrous walls indenting the brain $1\frac{1}{2}$ by 1 by 2 inches. Wall excised. Result: On the fourth day return of convulsions, with left hemiplegia and mental dulness. Wound opened; large clot removed. Immediate relief of hemiplegia and mental dulness. Recovered; discharged perfectly well. Fits recurred in five months. Wound reopened; cyst had refilled; was drained. Became infected in June, and died in convulsions in July. Necropsy showed an extensive cyst beneath the one drained.

Case VII.– M., 19. General symptoms: Severe headaches after general convulsions. Fracture of left frontal bone at age of 1, with large defective region of skull and fluctuation. Local symptoms: Spasms in right hand, going on to general convulsions in a series as many as 300 at a time, once in two or three weeks. No paralysis or aphasia. Duration of symptoms: Since injury, eighteen years. Diagnosis: Cyst of the meninges, with pressure on the brain. Operation by Dr. Hartley, March 8th, 1895. Trephined behind the defect

in the bone, and a large area exposed. Large cyst, 3 by 2 inches, extending into the brain emptied. Fibromatous bands within the cyst forming honeycomb-like tissue. Cyst drained. Result? Death six days later from exhaustion. Necropsy showed that the brain had been compressed by the cyst, and infiltrated with connective tissue from the cyst wall, which was adherent.

Case VIII.—M., 17. General symptoms: Headache, frontal; exhaustion on exertion of unusual kind; vomiting attacks; optic neuritis; hebetude and irritability; slight convulsive seizures; general feebleness; vertigo; incontinence of urine on several occasions; pulse slow. Local symptoms: Exophthalmos of left eye; paresis of right face with thick speech; athetoid motions of right hand; right knee-jerk increased; dulness to percussion over left frontal region. Duration of symptoms: Nine months of slow increase of symptoms: a blow over the site of the tumour had been received three years before. Diagnosis: Tumour in left second frontal convolution at posterior part; probably sarcoma, from slow progress. Operation (by Dr. W. W. Keen, May 10th 1896): Bone flap chiselled over frontal region, and enlarged by rongeur. Tumour found protruding through cortex, and removed with its capsule. Sarcoma $3\frac{1}{2}$ by $2\frac{1}{8}$ by $2\frac{5}{8}$ inches. The ventricle was opened and drained and then packed with gauze. Result: Progressive recovery. In June, 1897, was well in all respects except for a weakness of vision due to remaining optic neuritis, which was still improving. Reported: *American Journal of Medical Sciences*, November. 1896.

Case IX.—F., 35. General symptoms: Headache left side frontal and temporal; nervous and mental excitability; loss of memory; optic neuritis; staggers to right and backwards; somnolence. Local symptoms: Progressive motor aphasia with use of wrong words; confusion of thought going on in three months to monosyllabic speech, alexia, agraphia. Slight hemiplegia worse in arm, not severe, but progressing rapidly in two weeks. Duration of symptoms: Four months. Diagnosis: Tumour in left third frontal convolution invading motor region or tract, probably glioma from rapid progress. Operation by Dr. R. F. Weir, December, 23rd, 1896: Trephined and opening enlarged with rongeur over lower frontal region; nothing found. Result: Gradual exhaustion; death on tenth day after operation; symptoms unchanged. Necropsy: Glioma, vascular, 2 by 2 by 1 inches in left temporal lobe inner forward part.

Case X.—M., 40. General symptoms: Headache, mental irritabiliity, occasional general convulsions. Local symptoms: Hesitation in use of words and mispronunciation; difficulty in reading and

writing ; tactile apraxia in right hand ; slight right hemiparesis. Duration of symptoms : Symptoms developed after compound fracture of left parietal bone with defects ten months before operation. Diagnosis : Depressed bone with probable cystic tumour causing pressure on inferior parietal lobule. Operation by Dr. McBurney, January 28th, 1897 : Old fracture exposed and opening enlarged, bone thickenings chiselled away ; dura thickened ; fibro-cyst with much fibrous tissue found ; cyst emptied ; fibroma removed. Result : Immediate improvement in speech ; four days later aphasia became complete and hemiplegia worse ; wound opened and clots removed ; progressive recovery ; return of fits four months later ; present state about as before operation.

Case XI.—M., 30. General symptoms : Headache, frontal and occipital ; vertigo, increased on motion ; tinnitus, hebetude, stupidity, drowsiness, optic neuritis, exophthalmos, nystagmus. Local symptoms: Numbness in left face and mouth ; paresis of left internal rectus ; deafness of left ear ; staggering gait ; falls forward and to right ; weakness of right hand ; knee-jerk r $>$ l ; ankle clonus in right foot ; pain behind left ear. Duration of symptoms : Three years of gradual increase up to time of diagnosis 1 ; treatment for two years, then diagnosis 2. Diagnosis : 1. Tumour, specific treatment for eight months ; no results. 2. In cerebellum on left side. Operation by Dr. McBurney, December 3rd, 1891 : Chiselled opening over left occipital bone : nothing found but great bulging of brain. Result : Convalescence for six days, then hæmorrhage due to fall out of bed ; shock ; fever, 105° ; death on December 15th. Necropsy : Tumour ; gliosarcoma, 2 by 1 by 1 inches, on ventrocephalad surface of left cerebellar hemisphere compressing pons 1 V. n. 1 VII. n. and 1 VIII. n. Reported : *American Journal Medical Sciences*, April, 1893.

Case XII.—E., 7. General symptoms : Headache, frontal , general. Vomiting ; optic neuritis ; vertigo. Local symptoms : Staggering gait, falls back and to left ; earache in right ear. Duration of symptoms : One year of general symptoms, then three months of local symptoms. Diagnosis : Tumour of cerebellum on right side. Operation by Dr. McBurney, December 29th, 1891. Opening chiselled through right occipital bone. Nothing found. Cyst evacuated by needle. Result : Increase of symptoms ; shock. Death six days after operation. Necropsy : Tumour ; gliosarcoma, $2\frac{1}{2}$ by 2 by 1 inches in middle lobe and extending into both hemispheres of cerebellum, chiefly into right side, pressed on fourth ventricle, Reported : *American Journal Medical Sciences*, April, 1893.

Case XIII.—M., 19. General symptoms : Headache, frontal ; ver-

tigo, vomiting, hebetude and irritability ; optic neuritis ; nystagmus. Local symptoms : Staggering gait, falls to left side ; ringing in left ear ; deafness in right ear ; paresis of right external rectus ; loss of smell in left side ; paresis of right side of face ; knee-jerks diminished. Duration of symptoms : Six months of general symptoms and four months of local symptoms to time of diagnosis, March 10th, 1893. Diagnosis : Tumour of cerebellum right side of base. Operation by Dr. McBurney, March 15th, 1893. Opening chiselled in right occipital bone. Tumour found, and partly removed ; two cysts opened, $1\frac{1}{8}$ by 1 by 1 inch. Glioma. Result : Death on eighth day from gradual exhaustion. Necropsy showed that tumour extended forward on the base beyond reach. Reported : *Brain Surgery*, 1894, Case XXIV.

Case XIV.—M., 28. General symptoms : Headaches ; general spasms, with stiffening of trunk muscles and clonic spasms of extremities and back without loss of consciousness, lasting one minute, many daily ; vomiting extreme ; vertigo on motion ; emaciation ; slow pulse ; optic neuritis ; nystagmus. Local symptoms : Staggering gait ; knee-jerk normal. Duration of symptoms : Five months rapid progress to moribund state. Diagnosis : Tumour of cerebellum, secondary hydrocephalus. Operation : Dr. McCosh, January 15th, 1897. Trephined over right cerebellar fossa ; nothing found. Opening enlarged upward exposing occipital lobe ; ventricle-drained ; 30 c.cm fluid evacuated, and permanent drainage by tube about 20 ozs. daily. Result : Relieved of headache, vomiting and vertigo, and of the spasms ; pulse normal. Death suddenly from respiratory failure eight days after operation. Necropsy showed glioma 2 by 1 by 1 inches in right cerebellar hemisphere.

Case XV.—E., 11, General symptoms : Headaches ; vomiting ; optic neuritis ; blindness ; hydrocephalic head. Local symptoms : Staggering gait ; especially towards right ; slight hemiplegia ; knee-jerks diminished. Duration of symptoms : Fourteen months general symptoms, nine months local symptoms. Diagnosis : Tumour of cerebellum. Operation by Dr. McCosh, February 23rd, 1897. Occipital bone exposed ; found eroded and softened ; enormous hæmorrhage from skull required cessation of operation. Result : Discharged from hospital one month later in same condition.

ON THE DURATION OF THE PERIOD OF INFECTIOUSNESS IN SCARLET FEVER.

BY

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The period when a convalescent from scarlet fever ceases to be infective and becomes safe for discharge must at times be a source of anxiety to every physician who has charge of a fever hospital ; and it appears to me that this uncertainty is likely to continue more or less until the specific microbe of the disease has been definitely isolated, its life-history studied, and the extreme limit of its retention within the human body experimentally proved. Not till then, and until we have at our disposal reliable methods for detecting the microbe shall we be enabled to pronounce with certainty that a given patient is free from infection and incapable of conveying the disease. Until we arrive at exact methods we must be guided in dismissing patients from hospital by the result of close observation, accurate records, and carefully prepared statistics in connection with cases while in hospital and the relation which their discharge therefrom bear to the occurrence of fresh cases in the district to which they belong. By this means it would be possible in time, I think, to acquire fairly accurate information with regard to the probable period during which scarlet fever continues to be infectious.

That the period of infectiousness varies in different cases is true, and the severer the case the longer is it likely to remain infectious. Hitherto the generally recognized period during which isolation should be maintained in mild and ordinary cases is six weeks, provided desquamation is complete. In my opinion that period is too short, even in milder cases, and although I admit that the desquamating cuticle is infectious I am not certain that the completion of desquamation is a safe and reliable guide as to when a given patient ceases to be infective even in cases where no complication arises.

That a purulent discharge from the nose, ear, or a running sore, the usual sequele and complications which necessitate a prolonged period of isolation, is infectious has been proved beyond a doubt. But what is the source of the specific poison contained in these discharges ? Do these discharging surfaces afford conditions in which the specific microbe can increase and multiply ? The discharge itself comes from

the blood vessels, and if the blood has been rendered immune to the disease are not these discharges in consequence inimical to the growth of the microbe? In my opinion the source of the specific poison is not the mucous membrane of the nose or ear, or the surface of the sore, but the blood-stream, and that the mere existence of such discharging surfaces are not in themselves capable of prolonging the infective period, and that they only serve as exits by means of which a portion of the virus finds its way out of the circulation and the body.

It has not yet been shown that the cessation of the period of infectiousness and the healing of a discharging surface are coincident, and I do not think that such is always the case. Sometimes possibly the healing precedes, while at others I feel sure that the power of infection ceases before healing takes place. A discharge in some cases continues through a very protracted period, but it is obvious that infected material cannot be retained within the body indefinitely. Although the infective period varies in different cases is there not a time limit to the retention of the virus in the body beyond which no complication whatever can prolong the period of infectiousness?

In cases of infectious disease where the fluids of the body are more or less laden with specific poison a certain time must elapse under the most favourable circumstances before that poison can be completely eliminated, and in scarlet fever it appears that conditions exist, at any rate in some cases, which considerably prolong the period of complete elimination. In this respect scarlatina seems to differ from many of the other fevers, consequently the idea has suggested itself that a storing up of infective material takes place somewhere in the body, and this perhaps in the condition of spores.

I have noticed in scarlet fever that not only the glands of the neck but also the lymphatic glands in the axilla, groin, and other parts become enlarged during the earlier stages of the disease, and that the enlargement is more general and marked in the severer forms of the disease. Therefore I incline to the opinion that the specific poison accumulates in these glands causing irritation and enlargement. As the irritation ceases and the enlargement becomes absorbed, the virus passes again into the blood-stream, and is eliminated during convalescence by the different emunctory organs.

In typhoid fever great care is bestowed upon the disinfection of the discharges from the bowels and kidneys, and especially the former but in scarlet fever little attention is usually paid to these excretions. When the fluids of the body contain a specific poison is it not capable of being discharged therefrom by every organ whose function is to separate effete materials from the blood-stream? According to Crook-

shank the microbe of anthrax has been found in the discharges from affected animals. I think the desquamating cuticle in scarlet fever, especially in the later stages, owes its infectiousness very much to the excretion of the glands of the skin.

With a view of obtaining information as to the usual length of hospital isolation in scarlatina I issued a circular to a number of fever hospitals situated in different parts of England asking for the minimum, maximum, and average period of isolation that obtained in each place during the two previous years, and also the number of return cases which occurred within seven days of the discharge from hospital. From the replies received I find the minimum period varied between 4 and 5 weeks, while the maximum in some cases extended to 6 months. The average period the most useful for the purpose of comparison varied between 39 and 65 days. In many hospitals information regarding the number of return cases did not appear to be available, but I have been enabled to secure pretty accurate records of some 15,000 patients, and I find that where the average period of isolation was 49 days and under, the return cases averaged 1.86 per cent· where the average period varied between 50 and 56 days, the average percentage of return cases was 1.12, and where isolation extended to between 57 and 65 days the average percentage was 1.0.

Although I would not like to lay too much stress upon these figures yet they seem to point to the conclusion that the average period of retention in hospital bears a relation to the number of return cases of the disease.

The question of return cases of scarlet fever is an important and very difficult one. Of course a patient might become infected in the ordinary way, or might contract the disease from some source with which we are ill acquainted, and in each case this might be coincident with the return from hospital. The stowing away of infected articles belonging to a patient has been shown to be the cause of return cases, but with improved apparatus, and more perfect and thorough methods of disinfection, this probably does not play so important a part in the matter as formerly.

Allowing that a certain number of return cases contract the disease from other sources yet there is little doubt but that discharged patients in a certain percentage of cases are the direct vehicles of infection,

Several eminent authorities are of opinion that patients through breathing the actively infected air of a hospital during convalescence store up infective material in the cavities of the nose and lungs, and by that means convey the poison outside the institution. This may possibly occur, but were it the chief cause, would not the number of

return cases be even greater than it is? Moreover it appears to me in that case the percentage would not be effected by prolonged hospital isolation in the way the figures just quoted seem to show.

The lymphatic glands, I think, store up infective material. This has been previously referred to, and should any enlargement be found when a patient is examined for discharge it is my practice to prolong the stay in hospital in consequence thereof.

Systematic disinfection of the nasal cavities before discharge has been advocated, which no doubt is a useful and necessary procedure; also a convalescent ward in which patients may be prepared for a week before dismissal. I think there should be two such wards in connection with large hospitals, so that they can be used a week each alternately, and disinfected when not in use. This would ensure for the patient a purer atmosphere which would aid in freeing him from infection.

In view of the points raised and the facts referred to, it is doubtful whether a minimum period of retention in hospital of less than eight weeks is sufficient as I think it safer to increase and maintain the average rather by extending the minimum than by prolonging the maximum period of isolation.

From returns received I find that several authorities consider 13 weeks of isolation sufficient even in cases where complications supervene, and irrespective of the healing of discharging surfaces. I incline to agree with this, and think that a minimum of 8 and a maximum of 13 weeks may be considered safe until the contrary be shown by the result of accurate records based upon careful observation, or they be proved to be incorrect or inadequate by exact bacteriological methods.

Dr. Johnson (Glasgow) said this was a very important subject to those who had charge of fever hospitals. Having charge of such an institution in the city of Glasgow, it was a source of continual anxiety and worry to him that patients discharged might carry home the infection and communicate the disease to other members of the family. Yet the precautions taken were as complete as human knowledge could make them. The patient's clothes were sterilised by steam, and the patient had a final disinfection before being discharged after a minimum detention of 8 weeks. The percentage of return cases infected from dismissal were 2 per cent. Within the last few months he had seen one or two cases which for complications, such as suppurating ears, were kept in hospital for three months, and were apparently absolutely free from infection on their dismissal, but each case after going home infected a younger member of the family, and perpetuated the spread of the disease. He could not quite concur in

the glandular pathology of the paper. Bacteriological methods with respect to scarlet fever were by no means perfect, but everyone agreed that the infection, whatever it was, was very insidious and very tenacious of life. He verily believed that the healthy mucous secretion about the mouth and pharynx might retain sufficient infective matter to spread the disease in the household, especially if the patient, the night after being dismissed, were put to bed to sleep with a younger brother or sister. In such cases he often found it necessary to caution parents that children just discharged from hospital should sleep alone for two or three nights in a room by themselves, quite separate from any other member of the family. He believed there were at present a number of such cases, and it was very difficult, indeed almost hopeless, to entirely prevent them.

APPENDICITIS.

BY

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Mr. Chairman and Gentlemen,—I have thought that a discussion on appendicitis in this section might perhaps prove interesting and instructive for two reasons.

First, of course, because of the great surgical importance of the subject and the fact that more deaths occur annually from appendicitis than from any other acute surgical affection; and secondly, because we have an opportunity here at this meeting of bringing together for comparison the views of English and American surgeons.

Through the courtesy of my colleagues in the Montreal General Hospital and of my *confrères* in the Royal Victoria and Western Hospitals, I am able to place before you the results obtained in the treatment of appendicitis in those three institutions, as shown by an analysis of 517 cases, (It may be of interest to note just here the age and sex of those cases).

AGE.	SEX.		TOTAL.
	Male.	Female.	
1 to 10	19	13	32
10 " 20	75	62	137
20 " 30	138	71	209
30 " 40	69	13	82
40 " 50	28	10	38
50 " 60	7	3	10
60 " 70	2	2	4
70 " 80	2	0	2
	340	174	514

Three not mentioned. 340 males, 174 females. Nearly two males to one female.

This table certainly shows a rapidly increasing frequency of appen-

dicitis during the first three decades and a gradually lessening frequency after thirty.

The greater frequency of the affection in men than in women in the third decade is noticeable.

Etiology.—This difficult question is, at present, unfortunately only partly worked out. I have for some years felt that the entrance of fæces into this blind pouch of small calibre, and abnormal position was an important etiological factor. It goes without saying that whatever removes the protecting epithelium layer from the mucous membrane lining the appendicical canal creates a *locus minoris resistentiæ* and permits the entrance of ever present bacteria. I think the initial lesion is often of the nature of a stercoral ulcer. Then follow, according to circumstances difficult to define, either a perforating ulcer, or the thinning of the appendicical wall to a degree which permits the escape of pathogenic organisms into the surrounding tissues or a healing ulcer with subsequent contracture and stricture.

The investigations of Dr. Abbe are interesting in this connection and throw a good deal of light on the question of the pathology and morbid anatomy of appendicitis. He has studied appendices removed during the interval. He directs that within a few hours after their removal they be distended with ninety-five per cent. alcohol and then immersed for twenty-four hours or more in alcohol of the same strength. The appendices are then ready for transverse or longitudinal section and he seldom finds two alike. First a catarrhal inflammation may be followed by a stricture as in the urethra. Second, a natural point of flexure in the appendix (due usually to an abbreviated point in its mesentery) leads to an arrest of its fæcal contents which, becoming inspissated, grow into a concretion. Third, an otherwise healthy appendix may be the subject of circular ulceration from no apparent cause other than microbic infection.

Final obliteration evidently sometimes occurs, but even this change does not always rid the patient of pain, as in the process of cicatrisation nerve filaments may become included.

In 59 of my series of cases concretions are reported to have been present. In one case a pin was found in the appendix, and there is an appendix in the museum containing 10 or 12 shot, which never gave any trouble to the man from whom they were removed.

Dr. Abbe finds on microscopical examination of unstained and stained bits taken from the centres of many of these concretions, pus cells, exfoliated epithelium cells, minute bits of meat fibre and starch cells, with occasional crystals of decomposition. Dr. Abbe concludes

that the development of the diseased appendix may be said to pass usually through the following stages.

First.—A catarrhal inflammation of the lining mucous membrane.

Second.—Irregular narrowing of the calibre, with hypertrophy of the mucous and muscular coats.

Third.—Stricture.

Fourth.—Imprisoned food, desquamated epithelium, and pus, forming concretions.

Fifth.—Obstruction at the stricture, distention, perforation, abscess.

These observations certainly take us a step forward, although very much remains to be done.

Dr. Wyatt Johnston has prepared a number of appendices after the manner suggested by Abbe, but has used instead of alcohol Jores' solution of formalin, thus preserving the natural colour. This promises to throw considerable light on the subject of the early changes which take place in the appendix.

Mr. Rutherford Morrison finds that many attacks seem to come on during the night after sleep, and he would explain this by attributing it to the increased contraction of the unstriped muscle fibre in the wall of the appendix and cæcum during sleep, due to the increase of carbonic oxide.

The greater frequency of appendicitis in men than in women, especially in the third decade is noticeable. This may possibly be due to the greater physical activity in man, and the more common occurrence of violent strain, which might increase for the time the intra-abdominal pressure. Dr. W. H. Draper has suggested that the frequency of occurrence of appendicitis during recent years may be due to the poison of influenza.

Since 1889 there have been admitted to the Montreal General, Royal Victoria and Western Hospitals 517 cases of appendicitis with a mortality of 12.8 per cent. During this period cases of appendicitis have been submitted to operation with gradually increasing frequency. At first only the hopeless cases were operated upon and then the operation was often done as a *dernier resort*. Greater experience led to greater frequency of operation, and the results have improved and are still improving.

It is instructive to compare this mortality with that before 1889, that is, while these cases were treated in the medical wards without operation. Up to July, 1892, cases of appendicitis were admitted, almost invariably to the medical wards. Occasionally they were afterwards transferred to the surgical side.

Since July, 1892, all cases are admitted to the surgical wards unless

an attending physician brings one into his own ward, under his own care.

In the Annual Reports of the Montreal General Hospital from 1858 to 1873 peritonitis alone is mentioned. In succeeding years the term perityphlitis occurs quite frequently, with an average mortality of 12 per cent. Peritonitis cases at this time lessen in number but the mortality increases to about 40 per cent.

After the year 1890, perityphlitis is not mentioned and the term idiopathic peritonitis occurs but rarely. The term appendicitis becomes more and more common.

The total number of cases of perityphlitis, and peritonitis from 1858 to 1890	152
Two cases of pericæcal abscess	2
One case of perforation of vermiform appendix	1
	155
Deaths:—Perityplitis and peritonitis	35
Pericæcal abscess	1
Perforation vermiform appendix	1
	37

A total mortality of 23.8 per cent. nearly double what it is in the succeeding six years. The mortality has been reduced by the operative treatment to about half what it was before the operative treatment was introduced.

Further examination of the cases admitted into these three hospitals since 1889. shows that of the 517 cases treated, 389 were operated upon and 128 were treated without operation. Of these latter four died, a mortality of 3.12 per cent. These were the mild cases, and except in a few instances operation was not advised. The four deaths were due to septic peritonitis.

Of the 389 cases operated upon, 84 were interval cases, and in this group there was not one death.

Of the 305 cases operated upon in the acute stages 63 died, a mortality of 20.65 per cent. a rate of mortality in the severe cases less than in the whole series in pre-operative days.

Now I take it the important question is the cause of death in the 63 fatal cases, and how it may be avoided. Thirty-six were general septic peritonitis cases. Two tubercular appendicitis and peritonitis. Eighteen were abscess cases. Five were cases of septic inflammation of the mesenteric veins and liver abscess. Thus septic and tubercular peritonitis, abscess, and, mesenteric pylephlebitis leading to abscess of

the liver, account for 61 of the 63 deaths, and septic pneumonia and broncho-pneumonia for the other two.

I would like to mention here that we cannot as yet quite drop altogether the term idiopathic peritonitis.

There have been six deaths in the Montreal General Hospital during the past five or six years from general peritonitis, in which an autopsy was performed by Dr, Wyatt Johnston, and in which no cause could be found. Five of them were apparently a streptococcus infection and one a pneumococcus. One or two of them gave a history of having recently had a sore throat and several seemed to have occurred about the menstrual period. In one case I opened the abdomen and found a considerable quantity of sero-purulent fluid but could not find any apparent cause. I washed out the abdomen with normal saline solution and inserted a large drain to the bottom of the pelvis and the woman recovered. This attack immediately followed an evening's skating during menstruation.

The first three cases that occurred in my practice after graduation made a very strong impression upon me and I think they are worthy of brief mention.

First, in March, 1881, I attended a young man æt. 28, who developed well marked right sided local peritonitis, followed by symptoms of abscess formation. I asked my old professor in surgery to see the case with me and while he admitted that there probably might be an abscess inside yet he maintained that it was inoperable and my persuasive powers failed to gain his consent to an operation. The man had recurring chills and sweats until he died of exhaustion. At the autopsy, performed by Dr. Osler a large retrocæcal abscess was found.

Second, in December, 1883, an almost exactly similar course was passed through by a young man æt. 17. Only in this case I thought I would seek advice from a younger surgeon, but here again I was disappointed. The younger surgeon, said the case was one of typhoid fever. At the autopsy I found a large pelvic abscess connected with the appendix vermiformis.

Third, a young man æt. 19. Started with right sided abdominal pain followed by symptoms of abscess formation. This time I decided to avoid surgeons and called in the late Dr. R. P. Howard, at that time Professor of Medicine in this University, a most progressive man. He readily agreed to my diagnosis and supported my advice to operate. On the 24th February, 1884, the 24th day of the illness, I opened the abdomen on the right side and readily came upon a large retrocæcal abscess. I simply opened and drained, the appendix was not removed. The patient died on the 6th day after the operation and at

the autopsy, performed by Dr. Osler, who was then a professor in McGill, a mesenteric pylephlebitis was found. It was easily followed up along the branches of the portal, through the main trunk into the liver. Several abscesses were found in the liver and the mesenteric glands were enlarged. I must admit that the mortality rate was not improved by my operation, although so far as I know it was the first done in Montreal, but I got one lesson that I have never forgotten, viz., delay is dangerous. The successful treatment of general septic peritonitis is one of the most difficult tasks a surgeon has to undertake, and the secondary results of abscess formation are a frequent cause of death in appendicitis.

The abscess cases and the general septic peritonitis cases are the ones that increase the death rate. This is the group of cases which gives us our failures and the best way to treat them is to prevent them, to anticipate their development. This is accomplished in the vast majority of cases by prompt surgical interference. Even the fulminating cases are often preceded by milder attacks during which, or in the interval immediately following, an operation might have been successful.

The question of "time to operate" naturally arises here, and it is one that might be discussed for days. I believe it to be next to impossible to put in words a clear statement of the time to operate. There are two groups of cases upon which I think nearly all will agree. In one the attack is so mild that the question of operation during the attack scarcely arises. In the other the condition of the patient when first seen is so grave, that but few would dare to delay. But there is a much larger group where there seems to be room for difference of opinion. It is here that the judgment and experience of the surgeon need to be exercised to their fullest extent.

Operations in the interval are so safe that the question often resolves itself into whether there will be an interval or not.

Symptoms in apppendicitis are so thoroughly unreliable that no one or two can be taken as safe indications.

Pain, tenderness, muscular rigidity, vomiting, temperature, pulse, facial expression are all valuable signs, but they must be taken together and the opinion be based on the "toute ensemble." I find also that sometimes the further the case progresses the less reliable do the symptoms become. If we were able to foretell positively in a given case whether it would turn out well or ill then could we intelligently make selections, but we cannot by any symptom or group of symptoms be certain, therefore the surgeon should when in doubt give the

patient the benefit and operate. The cautious, conservative surgeon will operate early. Only the bold, will dare say, wait.

Physicians are helpless, they have no means of controlling or limiting the course of this disease. Purgatives may do harm and should be avoided. Opium disguises the condition and misleads the patient, the friends and the medical attendant. It should never be given until the diagnosis is clear and the course of action decided upon, and then only if it is thought that vomiting or active peristalsis will spread the infection, while preparations for operation are being made. The pain is seldom more severe than can be controlled by local applications of ice or hot fomentations.

To illustrate the danger of delay in even mild cases I will report the following experience.

A young professional man in this city was recovering from what his family physician described to me as a very mild form of appendicitis and apparently was making a most satisfactory recovery. On the sixth day he had no pain, scarcely any tenderness and a normal temperature and pulse. He was to have got up on the seventh day, but in the evening of the sixth day, while the nurse was out of the room, he went to the water closet to defecate. While there he was seized with intense abdominal pain and symptoms of collapse. I saw him shortly afterwards and had him removed to the hospital at once and operated with the least possible delay. Yet notwithstanding the most careful cleansing of the peritonial cavity and drainage, he died of septic peritonitis, the infection coming from a ruptured pericæcal abscess. I have seen a similar sudden rupture of an appendix with peritonitis follow the administration of a dose of castor oil. The patient was the wife of a veterinary surgeon and the oil was given on the third day after confinement. A few hours after its administration the lady complained of agonising abdominal pains, and chiefly on the *left* side of the uterus. A diagnosis was made of probable purulent salpingitis on the left side with rupture. I opened the abdomen and found the left Fallopian tube and ovary apparently normal. I then examined the right tube and ovary and found them normal also. It was a trying moment, because her husband was in the room, and it appeared as if I had unnecessarily undertaken a serious operation. It occurred to me to examine the veriform appendix and to my great relief I found it distended, ruptured at one point and pus escaping through the perforation. Fortunately the patien made a perfect recovery. Why the pain was felt to be so very much more severe on the *left* side I cannot tell. My working rule is to operate on all well marked cases at once. This includes all cases in

which there is pain, tenderness, muscular rigidity, with vomiting elevations of temperature, acceleration of pulse and anxious facial expression.

In the milder cases I advise operation if, at the end of twenty-four hours or thirty-six hours, I am not perfectly satisfied that the condition of the patient is undoubtedly improving and if all the symptoms are not decidedly less on the third day I urge operation strongly. I have no faith in the powers of any surgeon that I have yet met to individualise and select case suitable for operation and not suitable for operation after the third day. If they are not getting well by that time, they should be submitted to operation. I speak thus from experience. I have knowledge of many cases delayed by the advice of consultants, the delay being followed by disastrous results.

There are a few details in the operation upon which I should very much like to hear an expression of opinion.

First, in regard to general septic peritonitis. If undertaken before paresis of the intestinal wall has developed there is a chance of saving them, and they should be given that chance. I am still doubtful of the advisability of turning all the intestines out on the table and washing them and the abdominal cavity before replacement. I am afraid that it lowers the patient's recuperative power and the advantage gained seems to me doubtful. Of the injection of salines into the intestine, as advised by McCosh, I have no experience. The benefit of free movement of the bowels is appreciated by all, but enemata and purgatives, after washing out the stomach, generally succeed, and sometimes at this time opium seems to act as a purgative.

If the infection of the peritoneal cavity in general, thorough irrigation with hot normal saline solution is called for. The so-called antiseptic solutions are here useless and probably injurious from their action on the epithelial layer of the peritoneum. Normal saline solution washes out the pus and sero-pus well, and is non-irritating. The washing out should be thorough, and for this purpose pitchers are useless. An irrigator should be used with a long soft rubber tube attached, which can be carried into the pelvis, and into either loin alternately, and thus a stream be made to flow from within outward. By changing the position of the tube I believe the abdominal cavity and intestines can be washed out as thoroughly as in eventration and with decidedly less shock to the patient.

The next point is drainage, and this part of the technique has not received sufficient attention. A tube in the pelvis does not drain the loins. In these cases three tubes should be inserted, one into the pelvis and one into each loin, and they should be of large calibre. I

have used during the past year large rubber tubes, having a half inch bore. One is carried into the pelvis to the very bottom and one into each loin. Strips of gauze are passed down the tube and all the fluid taken out. This is done sufficiently often to keep them always empty. In this way dependant drainage is secured for the whole abdominal cavity. All the fluid will gravitate into one of these three spaces as the patient lies upon the back, and if it is removed as fast as it accumulates it amounts practically to dependant drainage of the whole abdominal cavity.

Now in regard to abscesses. I should say remove them as far as possible as soon as they are formed. Delay is dangerous. No surgeon can know in what direction an abscess is burrowing or of what its walls are composed, or where the wall is thinnest until he operates upon it. When it is found and opened, should the appendix be searched for and the limiting adhesions broken down ? I think the majority of experienced surgeons will say, No.

Before deciding that question let us see what tissues go to form the abscess wall. It will generally be found to be composed of the following : lymph, inflammatory tissue, appendix, intestine, omentum and mesentery ; tissues rich in lymphatics and veins. Through these the septic matters may enter and destroy the patient. Their early removal may prevent such an unfortunate ending. In the series of cases which I have reported there are five cases of mesenteric pylephlebitis and abscess of the liver, and I have seen three others in private practice. The channels of infection in these cases may be clearly traced right through the branches of the portal vein into the liver. It does seem but rational to remove at the time of operation all the infectious material that can be removed with a view of arresting or preventing the development of this fatal complication.

Only a few days ago I saw an old lady of 65, who said she had had a mild form of appendicitis, her first and only attack previous to her present illness, in Chicago, in the summer of 1896. It was a very mild form of the disease and operation was not advised. She made an apparently good recovery and remained well until about a fortnight before I saw her. At this time her family physician recognised the case as one of recurrent appendicitis, with abscess formation. The abscess seemed on physical examination to be almost entirely pelvic. In addition her urine, although about normal in quantity, contained albumen and granular and hyaline casts. Operation was mentioned as affording the only chance of relief, but that chance was so small that it was declined. A few days before death the old lady coughed up a considerable quantity of pus, and two days before death she

passed a quantity of pus through the urethra. At the autopsy the pelvic abscess was found connected with a ruptured appendix, mesenteric pylephlebitis—liver abscess, adhesion of liver to diaphragm, perforation of diaphragm, lung and bronchus. Delay is dangerous. Had this woman been operated upon during her first mild attack in Chicago, or in the interval after recovery, in all probability she would have been alive and well to-day. No man could have foretold the unfortunate ending in this case, or in any similar case, and I hold therefore that the only safe advice to give in any case of appendicitis is to have removed what is a menace to life.

Another reason for advocating the more radical treatment of these abscess walls and the search for the appendix is that otherwise second or third abscesses may be left unopened. Such unfortunate experiences have occurred in Montreal and doubtless in other cities, the secondary abscesses being found in the post-mortem room. As an illustration of this condition I may mention the following:

I was asked during the past winter to see, in the medical ward a case of abscess of the prostate. On examination per rectum I found a normal prostate but distinct fluctuation in front of the rectum, behind the prostate. Enquiry into the history left scarcely a doubt that the case was one of appendicitis. I made a latteral incision in the usual way and emptied the pelvic abscess, but found no trace of the appendix. I broke down the limiting adhesions, taking great care to protect the peritoneal cavity and on raising the cæcum, opened up a second abscess containing the diseased appendix. The man made a good recovery. Had I in this instance been content to drain the first abscess the man would probably have died. The second abscess had no connection at the time of operation with the first, and would not have been found had not the appendix been searched for. I might quote other similar cases but this one serves to illustrate my point.

I am advocating this practice for operating surgeons working in their own operating room, and I hold that under such circumstances it is possible to remove the appendix in nearly all cases, without infecting the general peritoneum. The intestines at once form new adhesions, and thus afford protection when the gauze pads are removed. In fourteen cases of the series there were two abscesses. In nine cases general peritonitis is reported to have developed after operation. In seven of these the appendix had been removed and in two it was not found. But it is difficult to say that the peritonitis resulted from the search for the appendix. It is quite possible that the infection had taken place before the operation was performed.

Since the first of last October I have put these principles which I

have advocated in the treatment of general peritonitis and abscess into practice with satisfactory results. During this period I have had under my care in the Montreal General Hospital twenty-nine cases. Seven of these recovered and declined operation in the interval. Twenty-two were operated on. Eight of these were admitted for operation in the interval. Fourteen were operated on during an acute attack, and in all the appendix was removed. In seven the appendix was gangrenous, and in five, perforated. Four were cases of general peritonitis and all recovered. Ten were abscess cases. They all recovered but one. This case was admitted on the fifth day, the abscess was opened, cleaned out with gauze swabs and the appendix removed. She did well for eleven days. The temperature became normal, bowels moved, food was well borne and she was looked upon as out of danger. On the twelfth day after operation she had a rigour, her temperature rose to 104 F. and she became decidedly septic. Four days later, my colleague, Dr. Kirkpatrick opened the abdomen. This second operation was unsatisfactory, except that it showed the absence of peritonitis. She died four days later, or twenty days after the first operation. Unfortunately we were not able to obtain an autopsy, but from the conditions present, I have little doubt that death was due to mesenteric pylephlebitis and liver abscess. The late date of the first operation was unfortunate.

Fæcal fistula followed operation in fifteen cases. Four of these died. Eight healed spontaneously, one healed after operation and in two the result is not stated. In two of the cases in which the appendix was not removed a second operation was performed for recurring attack. In each instance the appendix was removed at the second operation. Both recovered.

SOME SUGGESTIONS FOR THE TREATMENT OF INFLUENZA, OR THE GRIPPE.

BY

BEVERLEY OLIVER KINNEAR, M.D., New York.

The grippe, or as it is known in England by its old-fashioned name of influenza, is a very ancient disease, and common to any and every climate all over the world. It has been the direct cause of death in many thousands of cases, chiefly through the complications of the disease, such as pneumonia and capillary bronchitis ; or by adding to the labours of an already weakened, or diseased heart.

It has been the indirect cause of death in many more thousands, through the enfeebled conditions left behind by the attack, even when recovery takes place ; the convalescence in this disease being very slow even in mild forms, and the tendency to relapse, especially in respect to the catarrhal conditions of the bronchial mucous membrane, being great.

The chief feature of difference between ordinary catarrh of the nasal or bronchial mucous membranes originating from " catching cold," lies in the great prostration preceding, as well as accompanying the attacks of the grippe ; demonstrating some profoundly depressing influence to be at work, not found in the usual catarrh arising from cold.

This low condition is supposed to be due to a poison, of what nature it is yet hard to say, although a bacillus was discovered by Canon and Pfeiffer, which was thought by them to be the cause of the disease, as they found the bacillus in the blood, and the bronchial discharges. It appears to the writer, that it is just possible that bacilli may be the expression of a disease, and not a cause ; and that in the grippe, pathological conditions may originate the germ in the blood, and that therefore other causes may be found which will more satisfactorily account for the prostrated condition of the patient.

It is with the impression that such causes exist, that they may be identified, and in the hope that we may clearly elucidate them, or pave the way for their ultimate lucid understanding, that we undertake this exposition ; and at the same time if correct in the views set forth, advance some suggestions for treatment in accord with them ; and which we have found most useful in fevers and inflammations.

Wood and Fitz, in their recent work, " The Practice of Medicine," divide the disease nto five different varieties, and considering their

divisions as very clear, and easily distinguished, we will follow their nomenclature, examining particularly, in each division, the nervous conditions, the state of the circulation, the temperature and the catarrhal conditions : endeavouring to explain their origin, and thus demonstrate the advisability of the applications we advocate for their amelioration and removal. While influenza may not begin with a chill, it usually does so, and what are called the nervous symptoms soon follow in bad cases.

What is a chill ? It is a contraction of the blood vessels all over the superficial area of the body, yet frequently when there is such low temperature upon the external surface, there is a high temperature within the body, as can be observed in cases of chills and fever, and the high rectal temperature in cholera, during the stage of collapse.

And what may be the cause of this contraction of the superficial arterioles ?

It is acknowledged to-day by all leading physiologists and physicians, that the chief function of the sympathetic ganglia, is the contraction of the arteries; in other words they are particularly the vaso-constrictor centres.

This being the case, these centres must be functioning abnormally, to so close the surface blood vessels as to produce a chill, and the question which naturally arises, is: what is the agent acting upon the sympathetic ganglia which thus increases their function ? The reply which we have for sixteen years believed to be true, and which during that period we have seen no reason for altering, is, that excess of the arterial circulation when active, in nerve centres, increases the function of the centre, just as a very active circulation in a gland, or a serous membrane, will induce in the latter case, exudation, and in the former, increase of secretion. Clinically we have proved this view to be true many times, by aborting chills from many causes, by applying cold over the spinal region, in rubber bags not more than four and one-quarter inches wide, thus expelling excess of blood from the ganglia, and allowing the arteries throughout the body to re-expand, the blood to be freely re-distributed to all organs and tissues, and active metabolic changes (with their resulting heat) to take place.

Such is always the effect of cold over the spine in cases of chill except in very feeble individuals, or in patients where the vitality is at an exceedingly low ebb.

Oppositely, we have increased the function of the sympathetic ganlia by heat in a double columned spinal hot water bag, many hundreds of times, when the blood vessels acted upon by the ganglia over which the heat was placed, were unduly dilated, either in active or passive

hyperæmia, as congestive headache with great mental excitement, representing the first; or congestion of the lung without rise of temperature, illustrating the second.

Physiologists have proved that when cerebro-spinal nerves are excited after section, by galvanism applied to the cut end of the nerve nearest its nerve terminals, that if ending in a gland the artery supplying blood to the same, dilates, and the secretion of the gland is increased; but if the cut end of a sympathetic nerve is stimulated in the same way, the vessels in the gland will contract, and the secretion lessen.

It is now widely acknowledged by leading physiologists, that every motor nerve, carries with it trophic or vaso-dilator fibres, which terminate in the tissue cells of all forms of tissue, all over the body; and that when this nerve is excited, there will be dilatation of blood vessels within the area of excitement; or in other terms, there will be congestion, active or passive, or inflammation, from subacute, to its most violent form, according to the strength of the nerve currents issued from the excited, or hyperæmic centre, to the parts of the body implicated,

From the foregoing, it may be seen that if we can treat a case of influenza in the stage of chill or very soon afterward, our effort will be to break the chill at once, and this we should do, by applying the spinal ice bag, from the fourth dorsal to the third lumbar vertebra, and over this region alone in the "typhoid form" for the following reasons, viz: because when the reaction does set in from the chill experienced in this form of grippe, there is a strong inclination of blood to the head in greatly increased amount, as shown by the tendency to delirium, stupor, dry tongue, and continued fever; also the catarrhal condition of the nasal and bronchial mucous membranes, denotes hyperæmia of the same; all this in the "typhoid form" of the disease, and as we already have such an undue amount of blood circulating through the upper body, our effort is to expand the arteries widely in the lower body and legs, in order not only to break the chill, but to prevent the reaction of great hyperæmia into the localities named, after the chill is aborted; and this we can accomplish by cold over the region mentioned.

In an attack of grippe experienced by ourselves in the last New York epidemic, we were attacked by chilly sensations alternating with feverishness, severe pain and aching in all the limbs, much prostration, a tendency to sickness at the stomach, a good deal of hoarseness, and congestion of the larger bronchi, and of the nasal passages.

The ice bag as we have recommended was at once applied from the

shoulder blades to the line of the waist, with entire relief to the chills, the pain, the sickness at the stomach, and prostration, within two hours; it was re-applied every fourth hour for one hour and a-half at a time, except in the middle of the night, during the following thirty-six hours; when the only trace of the attack remaining was a little hoarseness, which annoyed us for some weeks afterward.

We believe that if caught in the early stage, the spinal ice bag used in the way directed will abolish the disease in many cases, and ameliorate the severity of the symptoms, in many more. Except in the early stage we would not advise this treatment, unless by an expert in its use, but would rather in the second stage depend upon heat over the spine to induce perspiration, and close the unduly expanded blood vessels in the hyperæmic areas.

Let us glance at a severe case of the "typhoid form" of the disease.

Here we have, continued fever, great prostration, muscular pains, dry tongue, catarrh of the nasal and bronchial mucous membranes, and either stupor, or active delirium.

The delirium or stupor, the fever, and the wide spread catarrh all denote hyperæmia of the brain, head, and chest, caused by excessive circulation in cerebro-spinal centres, issuing vaso-dilator nerves to this large surface involved.

In other words, the vaso-dilator centres are so stimulated in function that the sympathetic nerves terminating upon the arterial coats in the affected localities, have lost the power to contract the blood vessels; the balance of action maintained in health between the vaso-constrictors, and the vaso-dilators is destroyed for the time being, and the over-stimulated tissue cells cause the blood to riot and rush through the dilated arteries; giving rise to temporary insanity by the hyper-nutrition of the thought cells, or in the case of stupor, destroying all power of thought, by pressure upon them.

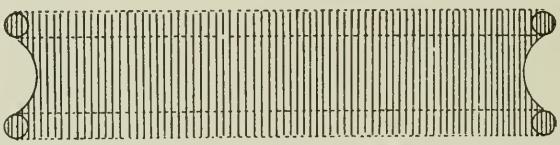
According to the facts, as well as the hypothesis presented in this paper, the indications for treatment are to contract the hyperæmic arteries, and to do it as quickly as possible.

This may be accomplished, and with great rapidity, by the application of the spinal hot water bag, over the cervico-dorsal region, or from the line of the hair, eight inches down the spine. Where the double columned hot water bag is not at hand or cannot be readily obtained, the same effects may be obtained by using a piece of thick flannel, one yard long, and eight inches wide, which may be rolled evenly and not too tightly, but compact from each end toward the centre, leaving an inch of separation between the rolls, so that they shall only cover the sympathetic ganglia; stitch the rolls in order

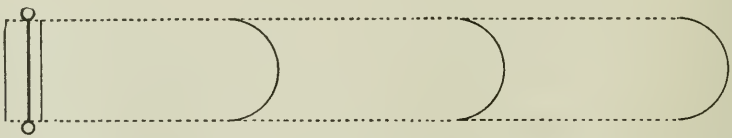
that they cannot come undone, dip them in water at 120 F., wring out quickly, and apply over the cervico-dorsal region, under a folded dry towel, and let the patient lean against them for one half an hour; then re-dip, and re-apply, and so on, until the temperature begins to decline, the skin to sweat, and the nervous symptoms to subside. Now remove, until there are signs of a fresh rise of temperature, and a renewal of the symptoms, when the treatment can be used in the same way, and so on, until convalescence is established. We advise at the same time in these cases a thorough evacuation of the intestinal tract, by a cholagogue cathartic.

This treatment will act in all inflammations of the lungs or pleuræ, or of the bronchial mucous membranes, in the early stages rapidly and effectively, as we can testify after a wide experience. It will also act in congestive headache, in sunstroke or heat stroke, with high temperature, and throbbing temporal arteries ; in hæmorrhages, and in various other congestions, when placed over the proper section of the spine.

The following sketch shows the flannel rolled, and stitched together :



We present at the same time a sketch of the spinal ice bag, which is divided into three compartments, and fastened with a clamp at the top ; thus one, two, or three of the cells can be used, as the case requires, the unused compartments being turned back over those in use ; in using one compartment always fill the top one alone, when two, fill the second compartment first, to the bottom of the top one, and then the top cell, to the line of the cross piece of rubber for the clamp ; if three cells are used fill the bottom one first, and so on.



After filling, the clamp should be screwed in place firmly, and the bag should be laid upon a table for five minutes, when it will be found to be bulged out with the latent air in the ice, which the warmth of the room has expelled. The clamp should be now un-

screwed sufficiently on one side to allow of the escape of the air ; at once tightly refastened, and the bag is ready for use.

The usual bag for the adult if of full length is 22 inches long, and four and a quarter inches wide ; and except in very tall or broad individuals, a broader bag will chill instead of warming the body.

In children, shorter and narrower bags are required, according to age and size.

In the " cardiac" form of influenza, where we have the constant menace of heart failure, and in the " respiratory" variety, where there is a tendency to catarrhal pneumonia, and capillary bronchitis, we strongly advise in the first, the inhalation of pure oxygen properly diluted with a gas of lighter specific gravity, in order to insure its absorption by the pulmonary capillaries ; because the first and most assured action of oxygen is upon the heart, second on the arteries dilating them all over the body, and thus distributing the circulation ; and third, upon the tissues, restoring normal molecular action.

In the respiratory form of the disease, we would use the hot water bag, over the dorsal vertebræ, combined with the inhalation of oxygen, and by these measures we feel assured that this form of grippe may be speedily relieved and cured.

Minute doses of antipyrine, aconite and pilocarpine may be used with benefit in the typhoid and respiratory forms of the disease, to lower the pulse and temperature and induce sweating, at the same time as the hot water bag is applied ; but we would not recommend more than half the usual doses, believing that they will be fully as effectual when aided by the heat over the spine.

The use of oxygen properly combined and prepared for therapeutical purposes, in laboratories established for that purpose, is absolutely essential, in order to obtain successful and the best results from its administration.

That prepared by calcium light manufacturers for commercial purposes is filled with chlorine, and other deleterious gases which will injure the patient ; while pure oxygen alone is too dense in its specific gravity to be absorbed by the capillaries. Therefore the purity of the gas, and its dilution with a gas of lighter specific gravity are to be insisted upon.

The gas which we believe to be most efficient for the purpose, is nitrous monoxide, and the formula which is now in use by the London Oxygen Hospital we consider the best. It is composed of two parts of pure oxygen, one of nitrous monoxide, and one per cent. of ozone to keep it fresh.

This preparation is freely absorbed by the capillaries and may be obtained in the " blue cylinder," sold by nearly all the leading druggists in the country, and at the New York Laboratory, of Dr. Walton.

Oxygen by cylinder is very easily administered, as there is a tube connected with a stop cock, and all that is required is to place the tube in the mouth, after strong expiration ; compress the nostrils, and inhale as deeply as possible, retaining the inspiration as long as is comfortable, and then exhaling through the nostrils. The gas should always be taken on an empty stomach, and in the erect position whenever it is possible, in order to allow of the fullest expansion of the chest.

In very sick people the tube should be placed in one of the nostrils, the gas turned on, and inhaled by the ordinary process of respiration.

From the whole ccurse of our suggestions and the entire tenor of our paper, it can be readily understood that the writer believes that vaso-dilatation of the arterioles with undue activity of the circulation, is due to hyperæmia in the vaso-motor nerve centres ; and that in all forms of active congestion and inflammation, in the early stages of such attacks, the most effective and speediest manner of relief and cure is by the appropriate application of heat and cold over the spine.

Hospital Reports.

FROM THE GYNÆCOLOGICAL CLINIC.

BY

T. Johnson-Alloway, M.D.

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Case H. G.—This patient, unmarried, was admitted into hospital complaining of severe reflex pain in both iliac regions, but of exaggerated severity on the left side. This pain radiates round to the lumbar regions and at times up towards the breast and head. Mammary neuralgia and headache are common symptoms indicative of ovarian and uterine disease and are probably the strongest evidence of the material existence of reflex pain, a condition doubted by some, many proofs of which, however, you will see by close observation of patients in these beds. This patient also complained of menorrhagia, very severe dysmenorrhœa and exhausting leucorrhœal discharge. She states that she has been a housemaid and is compelled to earn her living but that lately she has completely broken down from the effects of prolonged suffering

Examination.—I found the cervix bilaterally lacerated, but not extensively eroded. It is hard and small; uterus is enlarged, painful and in a state of chronic metritis. It is retroverted. The ovaries and tubes are prolapsed, enlarged and very painful to pressure.

Operation.—On opening the abdomen I found the ovaries enlarged to about three times their normal size, filled with unruptured Graafian follicles and large hæmatomata. The ovaries were lying down in Douglas' pouch under the retroverted uterus, a position which caused them to be subject to much injury from pressure. The tubes were also much enlarged and congested.

These diseased appendages were removed and the uterus sutured to the anterior abdominal peritoneum by one silkworm gut suture. Hysterorrhaphy. The wound was closed in the usual way. Cases of this kind are exceedingly common. They occur in women who have to do more or less hard work. After bearing one child they do not remain at rest long enough to allow the sexual organs to become involuted, consequently the uterus remains enlarged, heavy and prolapsed. The ovaries and tubes, which also undergo much enlargement during pregnancy, have their process of involution checked and

remain heavy, chronically inflamed and exceedingly painful to pressure. It can therefore be easily understood that so long as the primarily diseased organs remain, there will be no relief from suffering to the patient. This patient was 29 days in the hospital, made a good recovery and was free from pain on being discharged.

Case A. M.—Age 33, married. Complains of pain and tenderness in the left iliac region. Metrorrhagia. Great general prostration and chronic invalidism. Has had office treatment for years without benefit and has now expressed a desire to submit to operation, which she obstinately refused to undergo in the past.

Examination.—Abdomen slightly distended; marked superficial tenderness in supravesical, iliac and lumbar regions; uterus bulky, tender and retroposed; cervix bilaterally lacerated.

Operation.—Right ovary densely adherent to, and buried in, the posterior face of the broad ligament. It was found to be dilated into one large blood cyst. The tube was occluded and chronically inflamed, a condition known as pachysalpingitis, containing cheesy matter. The mesosalpinx was filled with numerous blood cysts. The left ovary was also densely adherent to the wall of the pelvis and was one mass of blood cysts. There was also a large cyst in the parovarium containing clear fluid. In this case the adhesions were separated, the diseased parts removed and hysterorrhaphy performed. No drainage. Time of operation forty minutes. Discharged on the twenty-eighth day free from pain.

Case M. G.—Married; no children. She came into hospital three weeks ago complaining of constant bearing down pain in the pelvis and sacral neuralgia. She suffers severe dysmenorrhœa, completely prostrating her and necessitating absolute rest in bed during the whole time of the menstrual flow. She has constant headache and alarming attacks of vertigo.

Examination.—Cervix elongated and eroded. There were masses of inflammatory exudation felt in Douglas' pouch. The uterus was retoverted and fixed. There was much pain evinced on an endeavour to move the uterus, and general tenderness throughout the whole of the true pelvis. Symptoms of this character are strong evidence of chronic inflammation of the uterus and appendages. This gives rise to fixations from peritoneal adhesions.

Operation.—When the cavity was opened I found the right ovary and tube low down and firmly fixed in the wall of the pelvis by strong membranous adhesions. These had to be carefully divided with scissors and the tube and ovary lifted to the surface. The left tube and ovary were situated in very much the same position in the left

side of Douglas' pouch. They were adherent to the posterior wall of the uterus by firm membranous bands. On separating these adhesions and bringing the parts to the surface, the bleeding cavity left in the bottom of the pelvis was somewhat extensive and gave rise to a very profuse and somewhat alarming hæmorrhage. This was, however, rapidly controlled by three deep sutures of catgut passed through the gaping edges of the torn broad ligament. The cavity was then packed with sterilised gauze, the operation finished, and the cavity closed, leaving the end of the gauze outside. This gauze packing was removed in forty-six hours. The patient made a good recovery; the gauze track closed perfectly.

In regard to this latter procedure, I would say that it is a most difficult thing to place gauze strips in such a way that the hæmorrhage will be controlled. The gauze must be absolutely aseptic and made in the shape of long finger bags, varying in length from twenty inches to three yards. It must be prepared by yourself or a responsible nurse under your direction; otherwise you may lose your patient by the slightest imperfection. The packing must also be arranged in such a manner that the coils of the intestines will not fold over it and be caught and injured during its withdrawal. The method recommended as Mikulicz is not easily applied and does not fill all the necessary requirements. The opening it leaves in the abdominal wall is altogether too large and coils of intestines and portions of omentum are likely to be withdrawn with it. There is also great liability to hernia occurring at the lower angle of the wound following its use. The best method consists in packing the oozing cavity with several thin strips of hemmed gauze, bringing their ends out of the lower angle of the wound. These ends are marked 1, 2, 3, and so on, according to their position in the pelvis so that they can be withdrawn in the reversed order to that in which they were originally inserted. I sometimes use a small sterile rubber tube between the packing and the posterior face of the uterus. This combination is much used in Germany, and in my experience makes the most successful abdominal drainage. It can be left undisturbed for eight or ten days, if necessary. I have left gauze in the cavity for thirty days without infection or any disturbance whatever to the patient. Cultures are made at each dressing, and in clean cases (free from pus) I have not known a growth to have been obtained.

Case E. D.—Twenty-five years of age. Entered hospital 1st June, 1897. Married, no children, no miscarriages. Leucorrhœal discharge. Menses began at ten years of age, regularly recurring every three weeks; duration eight days; flow very profuse; dysmenorrhœa, pain

in side and back ; bowels constipated. No sugar or albumen ; amorphous urates in large quantities. Uterus enlarged, tender, strongly anteflexed and bound down by adhesions, solidly in the pelvis.

Operation, June 25th.—A quantity of clear fluid escaped from the peritoneal cavity on first incision and a tumour was felt. This was found to be bound down by firm adhesions. The left tube was found to be greatly distended, measuring 2 cm. in diameter; broad ligament greatly thickened and ovary was enlarged to the size of a Florida orange. All these parts were adherent to the intestines and posterior wall of the pelvis. Adhesions were separated, but ovarian tumour had to be enucleated by splitting the capsule which was found by the broad ligament. During this portion of the operation pus escaped through rupture of the abscess. The ovary and tube were tied off, with catgut and removed. The tear in the broad ligament was repaired by a whipstitch suture, No. 3 gut. The right ovary and tube were found in a similarly diseased condition and removed. During the separation of the adhesions some portions of the peritoneal covering of the intestines were stripped off. These were carefully drawn together and whipstitched with a No. 2 catgut to prevent the weakened portion of the bowel giving rise to internal hernia. On completing the peritoneal toilet a glass drainage tube was introduced, and the peritoneal cavity closed. There was no oozing whatever. June 26th, the glass tube removed and its place taken by one of rubber, which was gradually removed by daily shortening. The patient made a good recovery and left hospital in four weeks.

Case F. G.—Unmarried. Entered hospital July 11th. Complained of pain in the abdomen ; leucorrhœal discharge for the last fourteen months. June 22nd last, patient was seized with sudden abdominal pain ; about two weeks afterwards pain returned and similar seizure took place, which continued severe from this out until her admission into hospital. Menstruated regularly every four weeks, but lately the flow appeared every three weeks with great pain ; duration four days, quantity profuse ; bowels constipated, urine normal, hæmic cardiac murmur and no hypertrophy.

Operation—Omentum and intestines were found adherent to the anterior abdominal wall. Everything was found adherent. A large mass of adhesion was found in the pelvis, composed of uterus, ovaries and fallopian tubes. On separating these parts considerable hæmorrhage took place; the left ovary and tube were found to be injured. The adhesions were old and separated with difficulty. These appendages were ligatured and removed; the same condition was found on the other side and was treated in the same way. This condition was

found to be a large tubo-ovarian abscess on each side. Some pus escaped into the cavity on division of the pedicles. The toilet of the peritoneum being completed, oozing still continued, therefore the pelvis was packed with about three yards of gauze. A rubber drainage tube was inserted alongside the pack, and the cavity closed in the usual way. The patient complained of very little pain during the following days. The gauze and tube were removed on the tenth day, the tube being re-inserted and fresh dressing applied. No growth could be obtained from gauze pack. This patient has done remarkably well; is about to leave the hospital the fourth week following the operation.

[The above cases were reported by the late Dr. Alloway shortly before his death, and it was his intention to have continued the series. He was unable to revise the proof, so any inaccuracies in the report must not be laid to his account. Editor.]

RETROSPECT

OF

CURRENT LITERATURE.

Obstetrics and Diseases of Infants.

UNDER THE CHARGE OF J. C. CAMERON.

Submammary Infusions of Salt Solution.

CLARK, J. G. "Submammary infusions of salt solution in primary anæmia from hæmorrhage, in shock, and in septic infection."—*American Journal of Obstetrics*, June, 1897.

Dr. Clark read a paper in December last before the Gynæcological and Obstetrical Society of Baltimore, in which he described the use of Dr. Edebohl's submammary infusions in the Johns Hopkins Hospital. He quotes from a recent editorial in the *Medical News* reviewing the work of Claisse (Revue de Chirurgie, 1895), and Bosc (La Presse Médicale, 1895), as follows:—"Take a patient suffering from severe infection, puerperal for instance; all the organs are affected and are working badly, the temperature is about 104° F.; in ten minutes 1,300 to 1,400 grammes of a saline solution are injected subcutaneously. Before half of that amount has been reached, the improvement is manifest. The pulse becomes more regular, fuller and stronger, respiration is deeper and less hurried, and possibly the temperature falls a degree at the end of the injection." "The patient feels better, is brighter and possibly desires to urinate, but not to any great amount. Usually the patient now enters what is known as the critical stage, which comes on generally in four or five minutes, though it may be delayed to half an hour. There is a violent chill with sensations of extreme cold, strong rapid pulse, and a rapidly rising temperature." Following this comes a fevered stage, then the temperature falls and there may be no more bad symptoms. The whole question is reviewed in the *British Medical Journal*, July, 1896. Dr. Clark reports a case of severe puerperal septicæmia in which a litre of saline infusion was injected daily for seven days, a marked improvement in the pulse being noticed after each injection. The patient felt more comfortable after the first injection. She began to improve

at once and finally recovered. The apparatus is simple and the method much easier and safer than radial infusion. In 41 of the last 225 cases of abdominal section in Dr. Kelly's wards, submammary infusion has been used as a stimulant, no patient having been allowed to suffer from symptoms of depression or shock without its employment. In none of these cases did cellulitis occur. Graduated glass jars of 1000 c. cm capacity are used as reservoirs for the solution (0.6 per cent.) Fitted to the reservoir is a piece of rubber tubing (5 ft.) to which a long slender aspirating needle (2 m.m. in diameter) is attached. The breast is thoroughly disinfected, especially its dependent area. It is then lifted well up from the thorax and the needle with fluid flowing from it, is thrust beneath the gland. Elevation of the reservoir generally suffices to make the fluid flow into the cellular tissue, till the breast swells out or even the fluid spurts from the nipple. When the injection is made, the needle is withdrawn and the puncture closed with adhesive plaster. If the fluid does not flow freely, it may be forced in by stripping the tube. The hands and tube are well vaselined, the upper portion of the tube is pinched between thumb and finger, and the column of fluid in the tube is gently stripped downward with the fingers of the other hand. The lower portion of the tube is then pinched and the upper portion released, allowing the fluid to fill the tube once more. The process is repeated till a sufficient quantity has been injected. As much as 700 c. cm. may be injected beneath each breast. If the operation is done aseptically, no ill results should follow.

The Bacterium Coli Commune in Child-birth.

G. Gebhard. "Ueber des Bacterium Coli Commune und seine Bedeutung in der Geburtshülfe."—*Zeitschrift f. Geb. und Gynakologie.* Bd. XXXVII. Heft. 1.

For some years bacteriologists have been working to determine what micro-organisms are capable of causing gas formation in the human body. Krönig, Schnell, Wendeler and Göbel, partly by laboratory experiments and partly by clinical investigations, have sought to prove that the bacillus coli commune does not play a prominent rôle in the production of *tympania uteri.* Gebhard, in his early investigations, was surprised at the constant presence of the bacillus coli commune on the external surface of the newborn in these cases, and from his later observations has been led to the conclusion that this bacillus is the cause of *tympania uteri* in a considerable proportion of cases. Any gas forming bacillus or coccus finding its way into the uterine cavity may produce tympany ; but it is so easy for

the bacillus coli commune to pass from the anus into the vagina and thence into the uterus, or to be carried thither by the examining finger, that it is quite reasonable to presume that it may be the causal agent in many cases. Gebhard examined 25 cases of *tympania uteri*, and demonstrated the presence of the bacillus coli cummune in 18 cases. He shows the incorrectness of Schnell's statement that the liquor amnii contains no substance from which the bacillus coli commune can form gas. His conclusions are that in *tympania uteri* the bacillus coli commune is an important etiological factor, but that in general putrid infection the anaërobic germs play a more important part.

The Ripening of Graafian Follicles During Pregnancy.

G. Cosentino. "Zur Frage über die Entwicklung und die Reifung des Graaf'schen Follikels während der Schwangerschaft."—*Monattsschrift für Geburtshülfe und Gynakologie.* Band V. Ergänzungsheft.

It has long been a matter of dispute whether ovulation continues normally during the course of pregnancy, or whether it is then modified or interrupted. Most observers agree that the function of the ovary continues, but hitherto have been unable to affirm that such ovulation is complete, because up to the present time not a single case has been observed where a ripe follicle has burst and discharged a mature ovum during pregnancy. Professor Cosentino, of Catania, has recently had an opportunity to examine the ovaries of a woman six months pregnant who died suddenly of heart failure. The microscopical preparation showed many follicles in different phases of development, and one which had ripened, burst and discharged an ovum. This ruptured follicle was nearly round in form, 15 m.m. in diameter, with indented borders, richly supplied with a network of arteries and veins. In a mass of granular follicular detritus close by, was a ripe ovum with all its elements. This case furnishes the long sought for proof that the ovaries may continue their functional activity during pregnancy, that Graafian follicles may ripen and discharge fully developed ova.

Breech Presentations with Extension of the Limbs.

Blocq, (Paris). "Étude statistique sur le presentation du siège décomplété, mode des fesses."

Demelin. "Observation de dystocie par presentation du siège décomplété, mode des fesses."—*L'Obstétrique*, Juillet, 1897, p. 332.

These two papers were read before the Obstetrical Society of France. According to Blocq, at the Clinic (rue d'Assas), in 11 years,

175 cases of breech presentation were treated; of these 135 were complete breech. Interference was found necessary in 18 cases, 6 multiparæ and 12 primiparæ. The maternal mortality was nil, the fœtal mortality 7½ per cent. In the treatment of breech presentation with extended limbs (mode des fesses), when interference is necessary, two means are available, the forceps and the fillet. The fillet is most useful in anterior positions, the forceps in posterior positions. The chief objection to the use of forceps is that the blades are apt to slip. In 1894, Tariner proposed the use of both forceps and fillet in posterior positions, and Demelin reports a case in which he followed Tarnier's directions and saved both mother and child. The breech was fixed in the pelvis in the position S. I. L. P. (mode des fesses), and could not be brought down. A fillet was introduced, and then the axis traction forceps applied over the lower limbs; first the right blade was passed behind and to the right, then the left blade forward and to the left. The right hand made traction with the fillet, the left with the forceps. A greater amount of tractile force was used with the fillet than with the forceps, the latter being employed chiefly to correct the faulty direction. Delivery was comparatively easy. The method is certainly worthy of trial in cases of dystocia. By dividing the tractile force the fillet will be less likely to injure the thighs or fracture the femur and the forceps will be less likely to slip. Demelin maintains that by this method delivery can be effected more rapidly and with less injury to the mother.

The Treatment of Incomplete Abortion.

Ch. Maygrier. "Traitement de l'Avortement incomplet."—*L'Obsttréique*, Juillet, 1897, p. 321.

On May 13th, 1897, M. Doléris read an interesting paper before the Obstetrical Society of Paris, on the treatment of incomplete abortion, in which he favoured operative interference as a general rule. He reported 59 cases of incomplete abortion treated in his clinic (La Pitié), of which 26 terminated spontaneously and 33 artificially. The morbidity was insignificant. While in certain cases the use of instruments, such as the curette, brush, and ovum-forceps may be of service, in his opinion the best results are obtained by clearing out the uterus with the finger (Curage). Maygrier reports 275 cases in the Maternité de Lariboisière since January 1st, 1895, mostly in the third and fourth month when placental retention is most frequent. Of these 176 terminated spontaneously and 99 required operative interference; 268 were discharged in good condition and 8 died, being in a hopeless condition when they entered hospital. In two cases there was trau-

matic perforation of the uterus. From his statistics he concludes that in a large proportion of cases (176 out of 275), the retention of the placenta after abortion is not accompanied by accidents, provided strict antisepsis is observed, and that the expulsion of the placenta often takes place spontaneously in a few hours. He believes that speedy intervention is apt to increase the dangers of retention and that it is wiser to wait as long as the uterus continues its expulsive efforts and there is no apparent danger. He summarises the indications for operative interference as follows:

1. Whenever retention is accompanied by accidents, such as hæmorrhage, fever, offensive lochia, or signs of infection however slight.

2. In cases of multiple placenta, the increased size of the placental mass affording a greater field for putrefactive changes which may lead rapidly to grave infection.

3. In cases where the cause of abortion is doubtful and attempts at criminal measures are suspected. In such cases infection usually occurs, since the abortionist rarely takes antiseptic precautions. It is therefore more prudent to empty the uterus without delay.

4. Always, in hospital practice at least, when the retention has lasted more than 3 or 4 days even without accident, if uterine contraction has ceased and the os and cervix have closed. A patient should never be allowed to leave hospital until it is quite certain that the uterus has been emptied.

When it is decided to clean out the uterus artificially, digital curage is the safest method. Above everything, incomplete curage should be avoided. It is not enough to explore the cervix and extract that portion of the placenta which may be engaged in the os; the finger should enter the uterine cavity, explore every part and empty it completely. The patient should be anæsthetized and the cervix dilated sufficiently to permit the passage of two fingers. Hegar's dilators or a Champetier de Ribes' bag, or even laminaria tents may be required for this purpose, but metal dilators should not be used, especially those with two or three blades. In exceptional cases where it is found impossible to detach fragments which are very firmly adherent, the curette may be used, but the instrument should always be guided and controlled by the finger. When the placental fragments are large, there may be some difficulty in extracting them. Ovum forceps are not necessary or desirable, as they are apt to injure the uterus. Budin's manœuvre is generally sufficient and is preferable to the use of forceps. The uterus is compressed between two fingers introduced into the posterior vaginal cul-de-sac and the other hand compressing the anterior wall of the uterus through the abdominal parietes; the placenta is thus

pressed out of the uterine cavity quite easily. After the uterus has been emptied, a brush (écouvillon of Doléris or Budin) sterilised and soaked in carbolized glycerine is passed into the uterus and made to sweep off any remaining shreds or fragments of placental tissue and membranes ; at the same time it cauterises and disinfects the internal surface of the uterine walls. Finally the uterine cavity is irrigated and an intrauterine and vaginal tampon of iodoform gauze is introduced. If a curette is used, great care should be taken to avoid perforating or otherwise injuring the softened and thinned uterine walls. Even in skilful hands, serious accidents have occurred. The curette should be large and should not be introduced until the os has been well dilated, and it should be always guided and controlled by the finger. Ovum forceps are particularly dangerous in the treatment of incomplete abortion. Maygrier's experience leads him to rely upon digital curage when intervention is necessary, and to avoid the use of instruments as much as possible. Quinine (16 grains) has occasionally proved useful as an ecbolic, and as it can do no harm, he recommends its administration when there is placental detention after accidental abortion.

The treatment of incomplete abortion may be either expectant or operative ; Doléris rather favours prompt operative measures, while Maygrier follows Tarnier and interferes only when expectant treatment fails or there is evidence of impending danger. When the uterus is to be emptied artificially, both agree that digital curage is safer and better than curettage, and both limit the use of instruments as much as possible. Although their views differ somewhat, their statistics show that there is not a very wide divergence after all between their methods of treatment, and their results are excellent.

J. C. Cameron.

Reviews and Notices of Books.

Hygene and Public Health: Louis C. Parkes, M.D., London. H. K. Lewis, 1897. 5th edition.

The fact that this book has had to pass through another edition in less than two years, shows that its merits are appreciated, and makes any comment on our part unnecessary. Very trifling alterations only have been made. J.

Taylor's Manual of Medical Jurisprudence: Revised and edited by Thomas Stevenson, London. Twelfth American, from the twelfth English edition. Edited by Clark Bell, New York. Lea Bros. & Co., 1897. 832 pp.

The great regularity with which new editions of Taylor's Medical Jurisprudence continue to appear would be most gratifying to the departed spirit of its renowned author unless he happened to read them. We doubt if many persons who have taken the trouble to read Taylor in the original before he passed into the hands of editors, know how he has suffered in the process. An incoherent mass of new matter has been indeed added in the attempt to keep the book "well up to date," but it has not been purged of many of its errors, the legal mind being apparently considered as slow to reject error as it is to accept truth.

The book in its present form is undoubtedly very useful to lawyers or others who want to find statements to fit any view of a case which it may be necessary to maintain, but as a practical guide to medico-legal work it is rather too vague and non-committal. The following masterly summary contains all the information vouchsafed on the subject of chlorate of potassium: "Given in large doses it acts as a poison, producing severe vomiting, profuse purging, intense difficulty in breathing, lividity of the countenance, and profound depression of the heart's action. After death the blood is found of a chocolate colour, its pigment *having been destroyed*." Again, though over twenty pages are devoted to the discussion of the toxic results of the various carbonic gases, the following is all that is stated concerning the spectroscopic condition of the blood: "It is a remarkable fact that with the bright red colour of the blood seen in this form of poisoning, two absorption bands similar to those of oxy-hæmoglobin appear, and nearly in the same situation. They are, however, more refrangible than these, and are more in the greenish-yellow rays. A reducing agent does not affect these bands as it does those of oxidised blood. Hence, (!) if the person breathes only for a

short time, the carbonic oxide is expelled. In poisoning by coal gas carbonic oxide appears to be *sometimes* the cause of death." To offset this, three whole pages are taken up in discussing the legal aspects of the Maybrick case.

It is stated that no distinctive chemical test exists for semen. Also that the lungs of still-born children tend spontaneously to undergo gaseous putrefaction, no mention being made of recent proofs to the contrary. Even the X-rays do not appear to have been able to penetrate into this new edition, although they have constantly been used in courts during the past two years.

A good deal of the recent valuable work of J. N. Hall, of Denver, has been incorporated into the sections on gun-shot wounds. The chapter on blood stains has been enriched by some good, but diagrammatic microphotographs. The legal references inserted by Mr. Bell are really valuable, and one only wishes they were collected and classified in a chapter by themselves or as a separate volume instead of being scattered at random through the book.

A chapter on "Medico-legal Surgery" has been added. This consists mainly of lists of the officers of various American Railway Association Surgeons, (none of whom happen to be known as medico-legal authorities on any particular subject) together with a list of the titles of the papers read at last year's meeting of one of these societies, and forms a fitting anti-climax.

"Taylor" still remains a useful work of reference, but it is now too inaccurate to be a sound authority or a good text-book. To be really modernized it would practically have to be re-written. J.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

Stated Meeting, April 23rd, 1897.

GEORGE WILKINS, M.D., PRESIDENT IN THE CHAIR.

Abscess of the Pelvis.

Dr. F. J. SPEPHERD exhibited the pelvis of a male dissecting room subject, half of which was shown as a dry and half as a moist preparation.

There were sinuses in the lumbar, sacro-iliac and gluteal regions, and in the thigh and groin of both sides. The pelvis and sacral regions were filled with pus. On examination, the specimen showed beautifully how the disease was bilateral and what a small amount of original disease there was. The original disease was altogether confined to the intra-vertebral substance between the 4th and 5th lumbar vertebræ, and an abscess cavity was found here which had spread laterally down each psoas muscle and also down the sarcum into the pelvis. There was no spinal deformity whatever. The dry specimen showed new bone throughout about the lower lumbar vertebrae and the sacrum but no sacro-iliac disease. The moist preparation beautifully demonstrated psoas, pre-sacral, and lumbar abscesses, all proceeding from the original disease between the 4th and 5th lumbar vertebrae. Dr. Shepherd said this case explained one of the puzzles met with in surgical wards, where sacro-iliac disease was suspected and abscesses were found on both sides. In the present case the disease could only be searched for in front.

Subacute Lukæmia.

Dr. J. G. ADAMI showed the organs and described the post-mortem appearances in a case of this disease.

Polydactilism.

Dr. SHEPHERD exhibited skiagraphs of a case of supernumerary fingers and toes in a girl æt 17. He found the skiagraphs most useful in operating, and by them he was enabled to have a much more useful hand than he otherwise could. In both hands was a prepollex and in both feet a prehallux. In the feet there was also on each foot

a post-minimus, the post-minimus in the hands had been removed in infancy. There was no history of any such deformity in the family.

An Alleged Case of Uterine Air Embolism.

Dr. WYATT JOHNSTON related a case in which he had acted as expert for the defence in a recent murder trial, where the victim died suddenly, pregnant at the 4th month, and bore marks of attempted instrumental abortion. The cause of death alleged was as above, the air being assumed to have entered the sinus left open at a partial detachment of the placenta, but the autopsy was performed in an unskilful manner, the pelvic organs having first been removed and dissected before the chest was opened. On opening the chest the heart was ligatured and on opening it after removal sufficient air to give a distinct puff, audible to three medical witnesses, was noticed on puncturing the left ventricle. No air was noticed in the right heart, and none was observed in the uterine pelvic veins or vena cava or the veins elsewhere in the body, though the examination in this respect was incomplete, and the whole autopsy was done in so slovenly a manner that the brain, lungs, intestines and liver were not removed and none of the important vessels were slit open. The brain, lung and liver were described as being pale, and the heart free from blood or clot. As air embolism shows a distension of the right heart and veins with air and little or no air in the left, Dr. Johnston maintained that if only in the left heart, the air obviously must have entered the heart post-mortem. The removal of the heart before the air was looked for afforded it the necessary opportunity to enter from the outside while the vessels were beingtied off, and the evidence stated that a long narrow bladed knife had been plunged vertically down in opening the thorax, possibly cutting the carotid or innominate artery. Dr. Johnston had found that the heart when empty can be made to behave like a bellows, and that air can be forced in and out at will by holding the organ in a certain manner. If the heart is compressed between the finger and thumb, in the plane of the septum the ventricles are bound to assume a spherical form and air enters in sufficient quantity to give a distinct puff when held in the hand and punctered. When the heart is compressed perpendicularly to the plane of the septum air was always squeezed out. This depends on the physical law that if the circumferences are equal, circles and spheres enclose more space than ovals. This fact was demonstrated to the meeting by means of a calf's heart. In the case under consideration there was no record of any defect of the septum or patency of the transverse ovals.

The jury had returned a verdict of aquittal.

Stated Meeting, May 7th, 1897.

WESLEY MILLS, M.D., IN THE CHAIR.

Cerebro-spinal Meningitis Complicating Pneumonia.

Dr. A. D. BLACKADER reported this case and Dr. WYATT JOHNSTON exhibited the pathological specimens.

Dr. W. F. HAMILTON asked if the enlargement of the spleen was associated with softening.

Dr WYATT JOHNSTON, in reply, stated that the spleen was very rarely enlarged in pneumonia due to pneumococci, but when due to streptococci. enlargement was the rule.

Dr. MILLS pointed out that the failure of the respiration prior to the heart was suggestive. The relation between the cardiac, respiratory and vaso-motor centres was very close, and as the tendency in pneumonia was to watch the heart, one might take an erroneous view of the cause of death.

Bronchiectasis.

Dr. F. G. FINLEY reported this case of which Dr. WYATT JOHNSTON exhibited the pathological specimens.

The Value of Modified Milk in Infant Feeding.

Dr. D. J. EVANS read the paper. (See page 350 of the October number.)

Dr. A. D. BLACKADER congratulated Dr. Evans on the excellent *resumé* of the facts which he had given, but he was disappointed that in the paper Dr. Evans had presented no statistics of his own, although this modified milk had been employed in the Foundling Home for more than a year. Unquestionably this modification of cows' milk was the only scientific method for the artificial feeding of infants, and in his opinion it certainly was the duty of every physician to master the general principles on which its successful employment depended. Once acquired they were afterwards easily carried in the memory. He was glad to hear the use of only a small proportion of the proteids recommended. Unquestionably there was a very distinct difference in digestibility between the proteids of cows' milk and those of human milk, the latter being much the more soluble. This was a factor that could not afford to be disregarded. In his experience, in many cases of disturbed digestion in infants the proteids were the source of trouble, and in young infants it was often necessary to reduce the percentage of them very much, even so low as 50 or 60 per cent. Even with all the advantages supplied by the modified milk, we did occasionally meet with infants in whom even this small proportion of the proteids seemed to make trouble, the infants still passing curds, which

immediately disappeared on a suitable wet nurse being supplied. The one great objection to modified milk at present was the expense. It was the food for the rich and well-to-do, not for the poor. Dr. Blackader had for some time past advocated the establishing in various parts of the city depots for the supply of proper pasteurized milk or cream of known strength suitable for home modification. He was convinced that such could be supplied in jars at reasonable expense, and mothers be taught to do the necessary mixing themselves.

Dr. J. C. CAMERON agreed with Dr. Blackader in his remark that this milk was for the rich and not for the poor. He thought the whole profession should bring this matter before the charitably disposed public in order that the milk might be placed within reach of the poor. He was surprised to hear that there was a sort of undercurrent of suspicion against modified milk as a possible source of rickets. This was not so, and Dr. Evans paper had certainly shown its value.

Dr. KENNETH CAMERON felt that one reason that modified milk was not more used was the difficulty in understanding how to prescribe it. He had found that it was not an easy matter to write a prescription that one could make up oneself if necessary. The statistics of the Montreal Foundling and Infant Nursery showed that this method of feeding was vastly superior to any other that had been tried in that institution.

Dr. G. G. CAMPBELL agreed with the previous speakers as to the value of this milk. He had found its expense the great drawback and had had considerable success in a method of home modification based upon it. He used a Florence flask fitted with a perforated rubber cork containing a chemical thermometer for Pasteurising, and obtained the necessary proportions of cream and milk by having the patients receive their supply of milk in the ordinary glass bottles and syphon off the quantity directed.

Dr. J. B. MCCONNELL considered that physicians did not thoroughly understand the method of prescribing this milk. The great majority of children were overfed and advice and instruction to parents concerning the amount of food, he felt would be of more importance than determining the minute division of the constituents.

Stated Meeting, May 21st, 1897.

F. J. SHEPHERD, M.D., IN THE CHAIR

Two Cases of Myocarditis.

Dr. W. F. HAMILTON reported two cases of the above disease.

Case I. H. G., male, æt. 44, was admitted to the Royal Victoria

Hospital on three occasions between November 22nd, 1895, and March 13th, 1896, complaining each time of shortness of breath. The heart, though enlarged, showed no evidence of endocarditis, the limbs were œdematous, and the urine on one occasion contained a trace of albumin. Cheyne-Stokes respiration developed, but rest in bed and a vapour bath benefited him so much that he insisted on leaving hospital. Readmitted three days later with complaints as before, he showed on examination the same condition, and again had a trace of albumin but no casts in the urine which amounted to twenty fluid ounces *per diem.* Digitalis and rest again effected a marked improvement, and after sixteen days' residence he was discharged for the second time. Two and a half months later he was admitted for the third time with Cheyne-Stokes respiration and signs of cardiac failure of much more marked extent than before, cyanosis and pulmonary œdema having developed. The urine contained no albumin. A fatal attack of erysipelas occurred after twelve days in the hospital. Post mortem the heart was found enlarged (hypertrophy with dilatation) and free from endo- or pericarditis. Microscopically the heart muscle showed generalised interstitial myocarditis. The kidneys were passively congested.

Case II, W. S., male, æt 46, was admitted to the Royal Victoria Hospital on March 26th, 1896, complaining of paroxysmal attacks, pain in the chest, back and right shoulder, and "turns" of dizziness and faintness. The onset of these symptoms dated three months back, and followed "overlifting." On examination little was made out beyond slight enlargement of the heart to the left and an irregular pulse. On the fifth day of his stay in hospital he experienced one of the attacks, became pale and anxious looking, vomited once or twice, and died within a few minutes. A diagnosis of probable angina pectoris from coronary artery disease was made. At the autopsy the heart was found enlarged, and the orifice of the left coronary artery much narrowed, and patches of atheroma on the walls of the vessel. The area supplied by this artery contained patches of myomalacia—irregular, turbid and greyish in colour, and with several small hæmorrhages into the muscle. There was no endo- or pericarditis; general arterio sclerosis, but no changes in the kidneys. Dr. Hamilton emphasized the following points in discussing these cases:

1. The very great danger of making a wrong diagnosis in patients suffering from this disease.

2. The comparatively early age at which such marked changes may be found.

3. The freedom of endocardium and pericardium.

4. The influence of digitalis in one case of advanced fibrous myocarditis.

5. The possible common cause—alcohol.

Some Debatable Points in the Technique of Appendectomy.

Dr. G. E. Armstrong read a paper on this subject. (See page 1, the July number.)

Dr. A. Lapthorn Smith agreed with Dr. Armstrong in preferring a glass tube to gauze, for drainage purposes, advocated drainage through the flank in suitable cases. He thought the proper method of removing the appendix was to cut it off and invert the serous surfaces, as he could not believe that two mucous surfaces would unite. He had had two or three cases of faecal fistula following a simple ligature. Judging from his experience in the removal of pus-tubes, one should not only remove the appendix but also the inflammatory exudate, wash out the peritoneum and leave it dry, but in order to do this a large incision would be necessary.

Dr. A. E. Garrow asked if there was any difficulty in maintaining the position of the drainage tubes. In one or two cases he had used the method of drainage through the flank with good results.

Dr. J. Alex. Hutchison emphasized one or two points made by Dr. Armstrong. The occurrence of secondary abscess in the pelvis should always be kept in mind, and the part carefully explored. He cited a case in which this was the cause of death after an apparent recovery after operation.

Dr. F. J. Shepherd said it had been the custom of most surgeons lately when the abscess was found behind the cæcum to drain through the flank, and also in all cases to search the pelvis. The question of drainage was a vexed one. Punjee silk was recommended by Dr. McCosh. The speaker thought the object of gauze was to alter the lymph current rather than to drain. He considered that Dr. Armstrong's record of four recoveries in general peritonitis was most remarkable, and asked whether he had washed out the peritoneum. Dr. McCosh, in a paper read recently at Washington, reported saving six out of eight cases of general peritonitis by turning out all the intestines, and while an assistant washed these, washing out the abdominal cavity and closing with the intestines floated in saline solution. He also injected directly into the ileum two ounces of saturated solution of magnesium sulphate, and closed the puncture with a Lembert's suture. Dr. Shepherd stated that he had never seen a case in which there was diarrhœa which had not recovered.

Dr. Armstrong in reply said that he had practised all the devices for removing the appendix, and found that the tying it off with catgut was just as satisfactory as the more complicated methods. Silk was likely to become infected, keep up the discharge, and not heal until it came away.

In answer to Dr. Garrow, he said he had had no difficulty in introducing the tube, that a soft rubber tube laid in the abdomen without causing pain or interfering with the peristalsis. He preferred this plan to drainage through the flank, as it obviated the necessity of a second cut, and answered the purpose just as well.

In answer to Dr. Shepherd, he stated that with one exception he had washed out all of these cases. The washing must be done through a tube inserted into the furtherest part of the abdominal cavity, so as to secure an outward flow. The cavity could not be washed by pouring water from a pitcher.

Acute Leukæmia.

Dr. G. D. Robins reported this case.

Stated Meeting, June 4th, 1897.

Geo. Wilkins, M.D., President, in the Chair.

The Certification of Insanity.

Dr. T. J. W. Burgess, in introducing this subject, dwelt largely on the many errors made by the general practitioner in filling up the prescribed form for the commitment of patients to asylums, errors often leading to delay in the reception of patients.

One of the mistakes most commonly made was in the case of married women, whose legal names, in this Province, were not those of their husbands, but their maiden names. In this respect, the law here, based on the Code Napoleon, differed from that in Ontario, where a women's married name was her legal name.

Another respect in which certificates were often lacking was that the *facts* on which the diagnosis of insanity was based were not stated.

Two points were to be clear in the mind of every certifying physician: 1st that the patient was really insane, and 2nd that he was a proper person to be confined in an asylum. Insanity alone did not necessarily constitute a ground for the deprivation of liberty.

The *facts* on which these opinions were based should be stated in full. Merely to say that a patient was insane, or that he had delusions or hallucinations, was not sufficient. The reasons for judging him insane and the nature of the delusions or hallucinations must

be stated, as also any insane conduct on the part of the patient, and the reason for placing him in confinement, viz., that he was or might be dangerous to himself or others, or that he might be benefited by hospital treatment. As an example of a certificate sent him, and one which he had been obliged to refuse, Dr. Burgess instanced a case in which the only information given was, "patient tells lies." Here the patient truly did tell lies, but they were insane lies, in other words delusions, and this fact, with the nature of the false assertions, could just as easily have been stated in the first certificate furnished, had the doctor chosen to exercise a little care, as in the second, which he was obliged to supply ere his patient could be received.

As all forms required for the admission of lunatics to asylums are statutory, any mistakes such as the foregoing, and others instanced made therein, rendered them null and void, and physicians should not feel offended if asylum officials refused to receive papers not properly filled, as by so doing they would render themselves liable to severe penalties.

Dr. VILLENEUVE continuing the subject said that the full bearing of the registration of the insane may be best understood by citing the articles of the revised statutes of the Province of Quebec pertaining thereto. The insane for the purpose of registration are divided into two classes, viz.: 1st *Private patients;* under this heading come the insane, idiots and imbeciles, who can pay for their own maintenance, treatment, etc., either by themselves, their tutors, curators or persons bound in law to support them; 2nd *Public patients*, those who must be supported by the public. The law places no legal restriction on the admission of private patients; article 3188 simply says that the proprietors may receive insane persons, idiots or imbeciles.

With regard to the medical certificate referred to in the case of private patients, article 3189 says: "The persons above mentioned cannot be admitted, unless the proprietors of the asylum are furnished with an application according to form A., and a medical certificate according to forms B. and C., signed by two medical men, who are neither partners, nor brothers, nor in the relation of father and son to each other, to the proprietors of the asylum or to the patient, and who have each separately and personally, examined the patient before the application for his entry into the asylum. The forms A. B. and C., must be attested under oath."

The following article, 3190, enacts that the physicians who sign the medical certificate (forms B and C) must state precisely the facts resulting from their own observations and the information received from any other persons, on which they have based their opinion that such a person is insane.

Proceedings for the admission of *public patients* are a little more complicated; article 3195, covers the case and enacts as follows: "The following persons may be admitted to lunatic asylums at the charges of the government, and of municipalities, of incorporated cities, or towns, or of counties:

1. Insane who have not themselves or through some persons bound in law to provide and care for them, the means of paying, in whole or in part, the expense of their custody, maintenance and treatment, in one of such asylums;

2. Idiots or imbecile persons, when they are dangerous, a source of scandal, subject to epileptic fits or afflicted with any monstrous deformity, and are unable, wholly or in part, to pay their custody, board, maintenance and treatment therein. In the case of a public patient, two points must be made out: 1st That the patient comes within the meaning of the law which unlike for private patients restricts the admission of public patients to stated cases; 2nd That he must be supported by the public. This latter point is borne out by certificates signed, on statutory forms, by the clergyman, and the mayor, and secretary-treasurer of the municipality to which the patient belongs, (forms D E and K respectively, vide article 3195a)."

According to the same article 3195a, the medical certificate is made according to forms B and C., by one physician only, testifying as to the mental condition of the patient, indicating the particulars of his disease, the necessity of his being treated in an insane asylum, and of his being there detained.

In the case of idiocy or imbecility, the physician shall further declare whether the patient comes under the category of idiots or imbecile persons, who may be admitted to or detained in an asylum, and shall specially indicate the reasons upon which he bases his opinion. Such certificate cannot be received, if the physician who signs the same is related or allied to the third degree inclusively, to the proprietors of the asylum, or to the person applying for the admission, or to the insane person. The physician must be one who habitually practices his profession.

If the applicant is unable to write, form A must be sworn to before the mayor or a justice of the peace of the domicile of the patient. The medical certificate (forms B and C), clergyman's (form D) and secretary-treasurer's (form K), must be sworn to before a justice of the peace, a commissioner of the superior court, who may act as such for all the certificates in the same brief, but who must not have signed any of the certificates either as physician, mayor, secretary-treasurer,

or as applicant, as these persons are debarred by the law from acting as justice of the peace or commissioner of the superior court.

Also the same person must not sign two of the forms herein above mentioned, forms B and C, which constitute the medical, excepted.

All the certificates are null if they have been prepared more than twenty days before being sent to the medical superintendent.

All the certificates must be filled up on statutory forms which are supplied by the medical superintendents on demand. After they have been all prepared they must be returned to the medical superintendent for approval and permit to transfer the patient to the asylum.

Dr. J. B. McConnell felt that the diagnosis of insanity was of greater importance than the subject under discussion. He felt that in all cases one should have the advice of an expert. People who were only feeble and weak were often declared insane on the evidence of a friend.

Dr. T. Glover Lyon, of London, England, could not understand the difficulties in filling out the certificates complained of by the first speaker. He agreed with Dr. McConnell that the real difficulty lay in the diagnosis.

Dr. H. A. Lafleur drew attention to the fact that in this province imbeciles could not be admitted to an asylum unless they showed dangerous symptoms.

Dr. F. Buller thought the information received was exceedingly practical and valuable, and pointed out several difficulties he had met with in complying with the legal forms.

Dr. Wesley Mills hoped that before long sufficient would be known of the nature and cause of insanity to render the diagnosis more easy.

Drs. D. J. Evans, A. L. Smith, W. F. Hamilton and C. F. Martin asked some questions regarding specific cases, which were replied to by Dr. Burgess.

Dr. J C. Cameron could not see why the physician should be required to give a definite opinion in doubtful cases, and by so doing expose himself to an action for damages. He advocated having a place of detention, where, before being committed to the asylum, patients could be observed, and the question of their sanity or insanity settled.

Stated Meeting, June 18th, 1897.

Geo. Wilkins, M.D., President, in the Chair.

Sporadic Cretinism.

Dr. E. J. Semple showed a case of this disease. (Will be published later.)

Aneurysm of the Subclavian Artery.

Dr. C. F. Martin exhibited an enormous aneurysm of the left subclavian artery, and gave some notes of the history and autopsy which were briefly as follows :

The patient, who had entered Dr. James Stewart's ward in the Royal Victoria Hospital, June, 1896, was a man of 54 years, a laborer by occupation, and born in England. He had always been accustomed to heavy manual labor, was fairly moderate in the use of alcohol, and had never acquired any venereal disease. His health had been good up to two years before death, when for the first time there appeared some pain in the left shoulder, running occasionally down the arm and up to the back of the neck. It was at first regarded as rheumatism, but soon the pain became more severe, the lower part of the neck became swollen, and so also the left arm, which grew distinctly weaker and colder than the right. These symptoms all gradually increased, and the pain was so severe and persistent as to cause insomnia.

Physical examination on admission showed a rounded prominence in region of clavicle, from the insertion of sterno-mastoid to the junction of the middle and the outer third of clavicle, pulsating and giving a systolic bruit on auscultation. Dulness on percussion was manifest over the tumour, and naturally over the apex of the left lung to the first interspace. P. 72. The right pulse was full, regular and collapsing in character, with capillary pulsation visible in the finger nails. The left radial pulse could just be felt indistinctly. No pulse could be obtained in the left temporal or facial arteries. There was marked general arterio-sclerosis. The heart was enlarged to the left and right, and the sounds were best heard in the fifth interspace within the nipple line. There was a faint, soft systolic murmur at the apex, and a soft, short, diastolic murmur. At the base, double murmurs were detected at both orifices and traced down the right border of the sternum. The left pupil was smaller and less sensitive to light than the right, while the left vocal cord was paralysed. During the patient's prolonged sojourn in the hospital the condition progressively increased, except during a few weeks when it was thought the administration of potassium iodide in doses of 15 grains three times daily was having a beneficial effect. Soon, however, the pulsative tumour grew larger, the clavicle became distinctly eroded, and the swelling of the arm very much more marked. The skin latterly became discoloured, and the extension of the aneurysm seemed to threaten external rupture, so thin was its outer and upper covering. On August 24th the swelling measured $9\frac{1}{2}$ x 9 in. Dyspnœa, pain, swelling and weakness rapidly

increased during the last month, and the patient died on December 12th suddenly, the aneurysm not having yet ruptured.

The autopsy showed that there was much emaciation. The pupils were equally contracted. The left shoulder measured in girth 53 c.m. as opposed to 41 c.m. on the right side. The skin over it was bluish-red and parchmented. On examination the swelling was seen to be due to a large aneurysm commencing from the left subclavian artery, which showed already a dilatation at its origin 4 c.m. in diameter. Immediately after, the aneurysm spread out abruptly into a large sac, in which could be felt the eroded first rib, still attached to the sternum, but with its vertebral end splintered. The clavicle was bared of periosteum for two-thirds its length, and the articulation eroded and ragged, while the acromial end was splintered and fragmented. The acromion process itself was likewise bared of periosteum. The glenoid cavity was normal, as also the head of the humerus. In addition to these bony changes there was erosion of the second rib and the bodies of the first and second dorsal vertebræ. These contained, besides loose pieces of bone, some firm and loose clots. The wall was of varying thickness, the thinnest immediately over the shoulder. The aneurysm had markedly atheromatous walls in front, but behind it seemed to have dissected into the surrounding prevertebral tissues for some distance, as no definite wall could be detected. The aorta itself was dilated in the ascending portion, though not so much as the descending thoracic division, which measured 12 c.m. in circumference, though by the time the cœliac axis was reached its calibre was of normal proportions. Calcified plates existed throughout its whole length. The branches had features of some interest. The opening of the innominate artery was distinctly dilated, that of the left common carotid quite obliterated. On tracing up the brachial artery to the sub-clavian, it was possible to meet near their junction a dissection of the inner and median walls, where a commencing progression of the aneurysm was evident in this way. The brachial artery itself was small and thin, the radial still smaller and thinner, indeed more like a vein. In their corresponding veins there were numerous varices and thromboses, some as large as cherries. The heart was dilated and hypertrophied, and showed chronic aor and mitral endocarditis. There were elsewhere no features of the autopsy of special interest in connection with the aneurysm.

The Pelvic Viscera in Relation to Micro-organisms in Health and in Disease.

Dr. J. C. Webster read a paper with this title. (See page 91, August number.)

It was discussed by Drs. Lockhart, Smith, Martin, Evans and G. A. Brown.

Exhibit of the Appollinaris Company, Limited, London.

BRITISH MEDICAL ASSOCIATION.

30th Annual Museum.

This was held in the Victoria Skating Rink and was the largest and most complete exhibition of its kind that has ever been held in connection with the British Medical Association. So large and varied was the display that to give a detailed description of it is no easy task, and yet we feel that we must make the attempt, so interesting was the result of the efforts of the exhibitors. To Dr. James Perrigo, the Chairman of the Museum Committee, and Dr. James M. Jack, the Secretary, is especial credit due for the success of the undertaking;

Exhibit of Evans & Sons Limited, Montreal, Liverpool, London, &c.
At British Medical Association Museum, Montreal Aug. 30th to Sept. 5th, 1897.

these two with their Committee brought to a successful termination a task which at first sight would seem an impossibility. Their labours consisted first of all in procuring a suitable building and arranging it for the exhibitors, then, the exhibitors had to be corresponded with, prices for space fixed and rules formulated regarding what classes of exhibits should be admitted, lastly, they issued a full and complete catalogue, a work in itself of no small difficulty. The exhibitors speak in the highest manner of the treatment which they received from the Committee, and the Committee are much pleased at the way the exhibitors fell in with the plans and assisted in the arrangements.

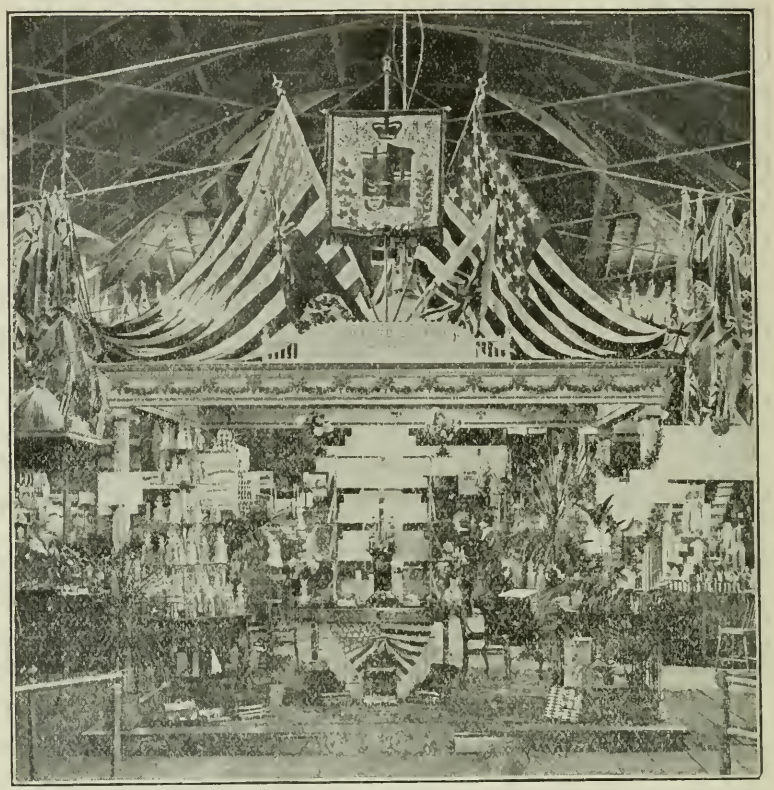

Exhibit of H. K. Mulford & Co., Philadelphia.

At British Medical Association Museum, Montreal, Aug. 30th to Sept. 5th, 1897.

The Skating Rink was transformed for the occasion and, filled with exhibits as it was, it gave a good idea as to what a medical fairyland would be. The exhibits were most tastefully arranged, no expense or trouble having been spared to make them attractive.

On entering the Rink by the Drummond Street Entrance one naturally strolled down the centre aisle, when straight in front, under a canopy supported by Corinthian pillars, was the exhibit of The H. K Mulford Co. Their specialty is the preparation of the various serums so much in use now, especially the diphtheria antitoxin. They also show a full line of compressed tablets. Their antitoxin syringes are designed for the administration of the serum preparations and are so constructed as to permit of thorough sterilisation of both the case and syringe.

But on either side of the centre aisle are exhibits which cannot be overlooked. Just inside the door on the one side the firm of Kerry,

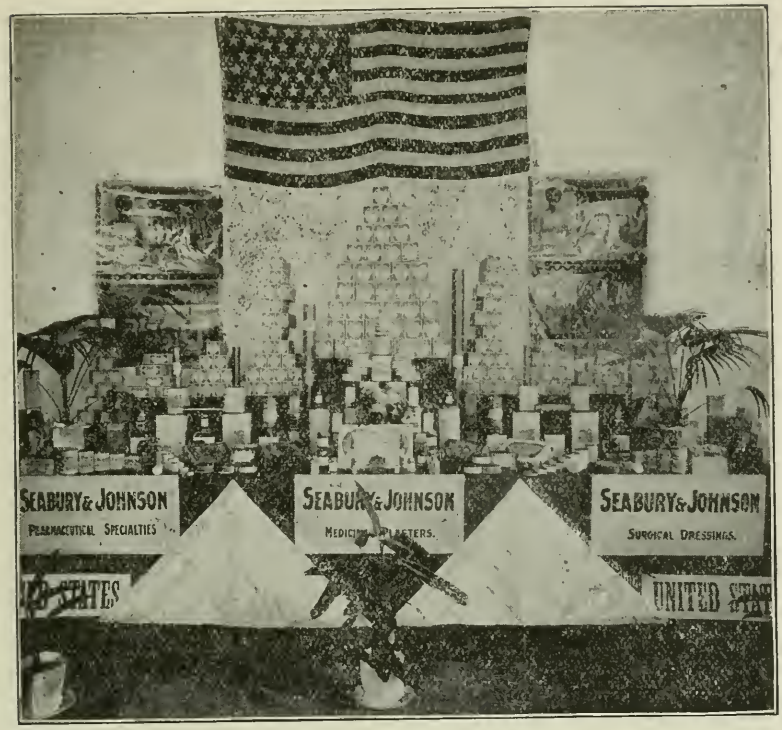

Exhibit of Seabury & Johnson, New York, Surgical Dressings and Plasters.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

Watson & Co., show a full line of their manufactures; Their tinctures which are made in accordance with the requirements of the pharmacopœia, the well-known Cardinal Food for infants and invalids, and their fluid extracts and elixirs. While on the other side the Pabst Brewing Co., of Milwaukee exhibited their well-known Liquid Malt Extract. Close by we see the aërated waters of Chas. Gurd & Co., a long list, including all the well-known aërated beverages and medicated waters. They are also the agents for the Caledonia Springs, the waters of which are so justly famed in the treatment of rheumatism and kindred affections. A large and attractive exhibit is that of Down Bros. of London, Eng., the brightly polished instruments of all sorts catching the eye and retaining the interest. Their aseptic surgical instruments are from new and original models and they show cases of instruments suitable for all departments of surgery; their aseptic furniture for the ward and the operating room is well worthy of inspection as it is made from designs furnished by the best men in

Exhibit of Andreas Saxlehner, Budapest, Hungary. Hunyadi Janos, Natural Aperient Mineral Water.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

England. On the other side of the aisle, Fairchild Bros. & Foster, by means of practical demonstrations, illustrated the action and utility of the various digestive ferments and pre-digested foods. Their pancreatic extract was the first product offered to the Profession containing all the active principles of the pancreas in the form of a powder. Their exhibit comprises the whole range of digestive ferments. Beside them is the well-known and popular table water from the Radnor Mineral Springs in the Laurentian Mountain district. The water springs from a bed of Gneiss Rock and, filtering through a potsdam formation, flows forth cold and clear. Duncan Flockhart & Co. of Edinburgh, whose agents in Canada, are R. L. Gibson, Toronto, are perhaps best known through their chloroform which is largely used throughout the world. Their Blaud Pill Capsules are made up on a novel principle so that the physician is able to prescribe in one capsule the equivalent of one, two, or three ordinary pills. Mellin's Food is the preparation shown by the Doliber-Goodale Co. of Boston: it is made of wheat, and barley malt, after the formula devised by

Exhibit of The Ripley Co., New York. Brom-Lithia Tablets (natural Ripley Brom-Lithia Water by evaporation) and of E. Fougera & Co., New York. Colchi-Sal, for Rheumatism and Rheumatoid affections.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

Baron Liebig and is valuable for infants and invalids. It is prepared for use by dissolving it in fresh water and adding cow's milk in proper proportion.

Continuing on our way we come to the attractive exhibit of Sharpe and Dohme, of Baltimore and New York. This house of manufacturing chemists was established in 1860, or, as they would tell you in Baltimore, "before the wah, suh," and to-day their name on a preparation places its excellence and reliability beyond all question. They are represented in Canada by Hy. J. Dart & Co., of Montreal, and Mr. Dart's many friends in the medical profession had an additional pleasure in being welcomed by him with a hearty hand-shake and a genial smile. Amongst the other preparations exhibited was their Ergotole, which, used hypodermically, causes neither irritation nor abscess, and when administered by the mouth, does not produce the slightest nausea. Their Lapactic Pills were very much in evidence, being contained in a huge glass jar which held enough

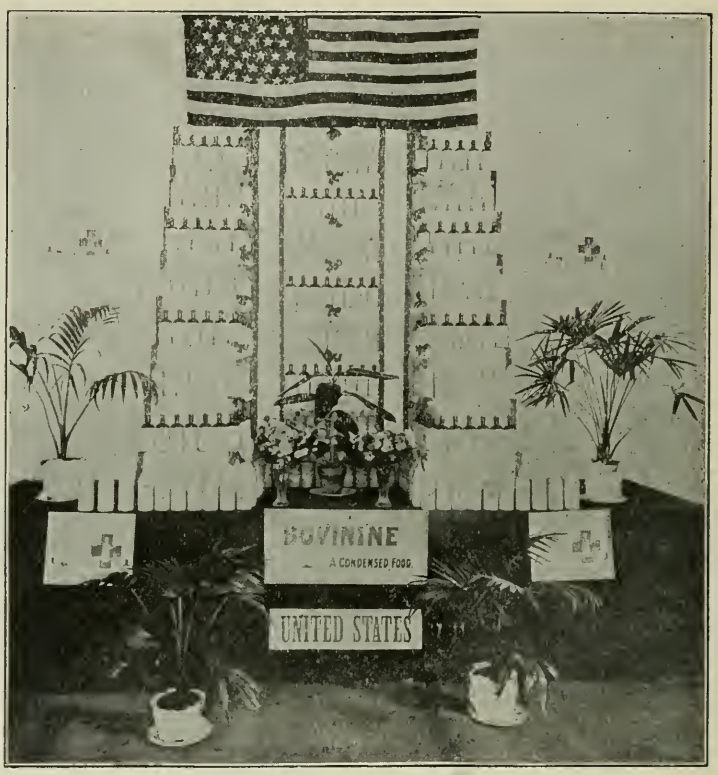

Exhibit of the Bovinine Co., New York, Bovinine a Condensed Invalids Food.
Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

Lapactic Pills to provide one for each man, woman and child in Montreal.

At the same table, the exhibit of Alex. Riddle and Co. attracted a good deal of attention. Their agents, Arthur P. Tippet & Co., took a very practical way of demonstrating the beauties of Stower's Lime Juice Cordial, by giving free drinks to all that applied, and they appeared to have great success in convincing people of its merits. But many longing eyes were cast towards the pyramid of bottles which occupied the next table. Here, alas, free drinks were not the order of the day. The bottles were filled with Canadian Club Whiskey distilled and bottled in bond by Hiram Walker & Sons. The Paul Paquin Laboratories of St. Louis, Mo., attracted a good deal of attention by the exhibition of cultures of a number of the more common bacteria. They showed the bacteria which caused the disease, and then exhibited their antitoxins and serums for curing the

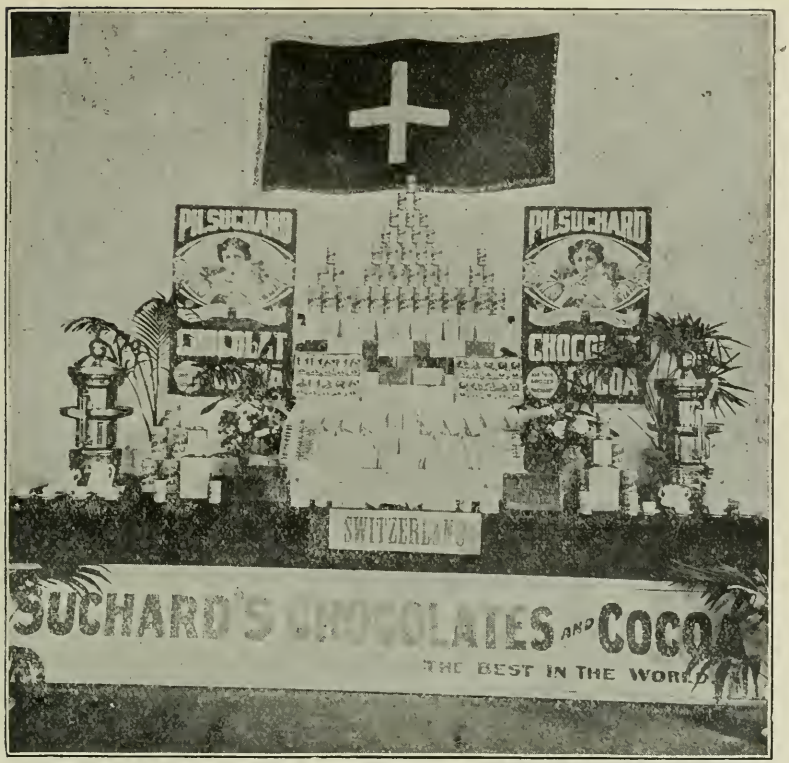

Exhibit of Russ, Suchard & Cie., Serrieres, Switzerland. Chocolate and Cocoa.
Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

disease, the whole forming an interesting and complete demonstration of the newer therapy.

One was inclined to linger before the space occupied by the Kny-Scheerer Co., the glitter of the instruments, the polished brass of the sterilisers and the clean white enamel of the hospital furnishings being very attractive. They showed a complete assortment of instruments, medical and surgical, of apparatus for the sterilisation of surgical dressings, of water, and of instruments, and a full line of furniture and supplies for hospitals such as operating tables, instrument and dressing tables, instrument cabinets and many other useful articles. And while always keeping the utility of the article before them, they cannot be accused of neglecting the ornamental, for all their articles are most carefully finished. As we pass on we are attracted by a most ingenious method of dispensing powdered drugs of all kinds. We refer to the Konseals which is an improved form of the old cachet. These and the Konseal Filling and Closing apparatus, is exhibited by

Exhibit of Henri Nestlé, Vevey, Switzerland, Nestlé's Milk Food and Nestlé's Condensed Milk.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

J. M. Grosvenor & Co. of Boston. The Konseals are capsules made of rice flour and possess the advantage of being perfectly soluble. By means of the apparatus provided they can be dispensed very rapidly. John Wyeth & Bro., exhibited a selection of their products under the charge of Davis & Lawrence Co., their general Canadian agents. Pills of all sorts, tablet triturates, elixirs and tinctures, a very complete and attractive line of pharmaceutical preparations.

Leeming, Miles & Co. represented a number of firms. They showed specimens of the medicinal plasters and surgical supplies of Seabury & Johnson. They also showed Marchand's peroxide of hydrogen and other oxygenated preparations. Nestlé's Milk Food also had a place here as also the new Coal Tar Product Ammonol. At the other end of this table the Apollinaris Co., showed both the Apollinaris and the Friedrichshall Waters.

The exhibit of Parke, Davis & Co., occupied considerable space and here we must spend a few moments and observe the Professor who is showing the interested observers the action of Taka-Diastase, a powerful ferment for the artificial digestion of starch. This ferment was

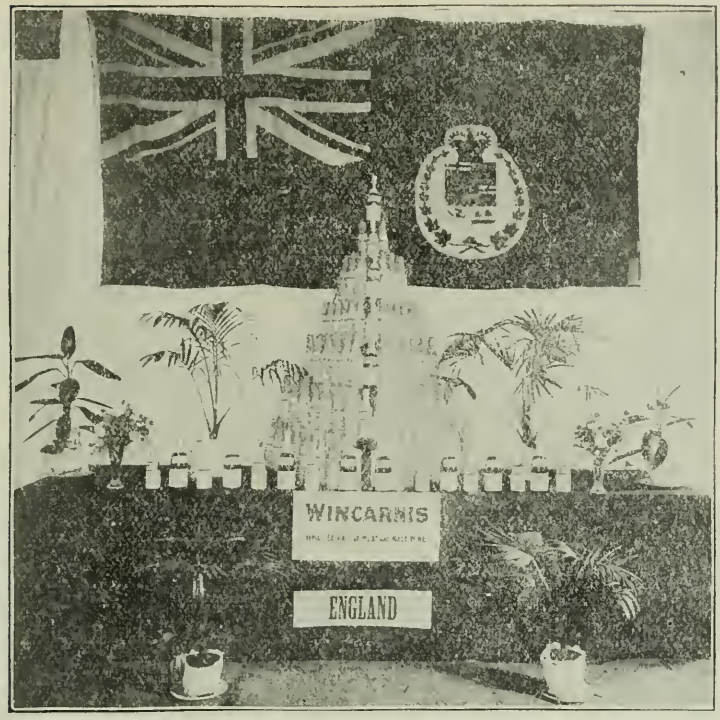

Exhibit of Coleman & Co., Norwich, England. Wincarnis, made from Port Wine Liebig's Extract of Meat and Extract of Malt.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

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first obtained in Japan; it grows upon bran and surpasses all other preparations in its diastatic power. But there are many other things in their exhibit which claim our attention; serum preparations, digestic ferments, thyroid preparations and a full line of pills, powders and other drug preparations.

Armour & Co., show tablets prepared for nearly every organ in the body, so that it is only necessary for the physician to diagnose with certainty which organ is not doing its work and straightway a little bottle of tablets makes up for nature's deficiencies. There are also samples of their pepsins and pancreatins, as well as Armour's extract of beef.

As we turn from this table the sight of a nurse's uniform makes the physician forget his whereabouts and imagine himself back in the hospital. Gilmour Bros. & Co., exhibit the surgical dressings, plasters, etc., of Johnson & Johnson, of New York. These were in charge of a trained nurse and the visitors watched her with profound attention as

Exhibit of Société des Eaux Mineral des Contrexeville, Paris, France. Eau de Contrexeville for Gout, Gravel, etc.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

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she showed them samples of Bernay's sponges, dropping them into a glass of water to show how much of this fluid they would absorb. The spectators seemed to think that there was something of the conjurer's art in the process. The same firm also showed the products of the Upjohn Pill & Granule Co., who manufacture the friable pills which they claim are more readily absorbed than are other pills, being more easily broken down and reduced to a powder. To prove their contention they gave away small pieces of pine board into which had been hammered old pills made by other manufacturers.

At the east end of the rink are the handsome cases filled with the drugs manufactured by Frederick Stearns & Co. Here we see their well-known Aromatic Cascara and their Wine of Cod Liver Oil; their Hæmoferrum both in solid and liquid form is likely to prove useful in cases where iron is indicated. Bnt what attracts the eye more than

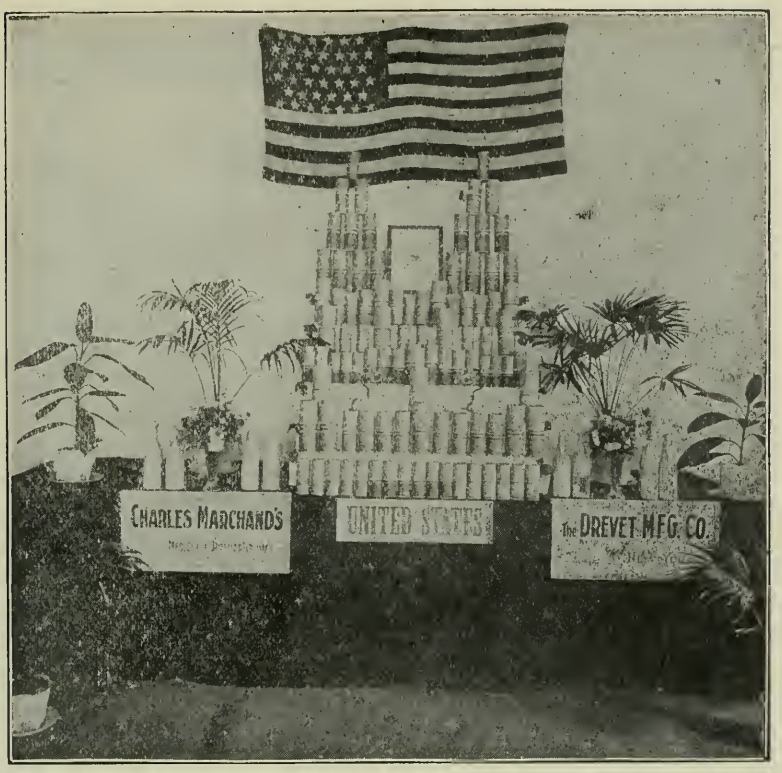

Exhibit of The Drevet Manufacturing Co., New York, Charles Marchand's Peroxide of Hydrogen, Glycozone and Hydrozone, Marchand's Eye Balsam.

Exhibited by Leeming, Miles, & Co., Agents for Canada, Montreal.

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anything else in their exhibit is a huge glass globe filled with various coloured pills, very prettily arranged in layers and forming a unique advertisement of the uniformity of shape and superiority of finish of their manufactures.

The Laurentian Springs Water Co., who are proprietors of the Laurentian Baths in this city, exhibited the soda water and table waters which they supply. These are made from the water of the Laurentian Spring, which is an artesian well of great depth. The water contains the chlorides of sodium and potassium, the sulphate of sodium and the bicarbonates of sodium, magnesia, and lime. The Davis & Lawrence Co. had here a large exhibit of plasters, dressings, and surgical supplies prepared by J. Ellwood Lee & Co. Their antiseptic dressings are put up in an exceedingly convenient form, so that it is easy to remove small quantities without infecting the whole. At

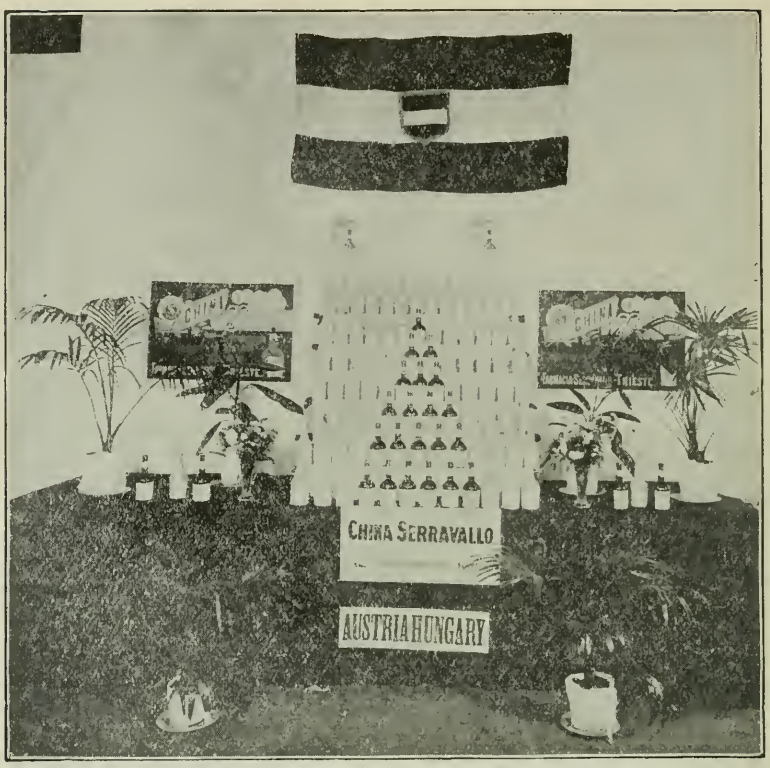

Exhibit of J. Serravallo, Trieste, Austria. China Serravello Ferruginosa. For Weak Persons and Convalescents.

Exhibited by Leeming, Miles & Co., Agents for Canada, Montreal.

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the end of this table S. Kutnow & Co. were distributing samples of their Carlsbad Powder and their anti-asthmatic powder and cigarettes. These preparations are well-known in England, but have never, heretofore, been introduced in this country to any extent.

Paterson & Foster have a very pretty exhibition of microscopes and microscopic appliances made by C. Reichert, of Vienna. The Formaldehyde generators, made by the Sanitary Construction Company, of New York, open up quite a new field in the way of disinfecting apartments, etc. By means of these generators the work can be done rapidly and much more efficiently than by the old method of burning sulphur. They also show surgical and dental instruments of all sorts as well as batteries and electrical appliances. Evans & Sons showed the preparations manufactured in their laboratories and drug mills: sugar coated pills, elixirs, fluid extracts, Savaresse's capsules (not made of gelatine but of membrane) which do not dissolve until

they have left the stomach for the intestine, and many other preparations. They also submitted samples of the Montserrat Lime Fruit Juice, which is the only kind used in the British Army and Royal Navy.

In another part of the hall the same firm exhibit the Moffatt Formaldehyde generator, which produces this gas directly from wood alcohol, and thus does the disinfecting in the most economical manner possible. Their exhibit of Hansen's rennet and junket tablets, for which they are the sole agents, was worth inspection, for here is an easy way of making junket, which is an exceedingly desirable food for invalids.

Under the gallery on this side of the Rink the Gurney-Massey Co. have placed their hot water heaters, hot air furnaces, stoves and ranges, locks and scales, plumbers' supplies, and many other articles, while directly opposite to them, under the gallery at the other side, is the exhibit of the McClary Manufacturing Co., represented by R. & W. Kerr, manufacturers of stoves, ranges, enamelled ware, and Japanned and stamped tinware. Passing along towards the front of the Rink, an exhibit, interesting to medical men, is met with. It is that of B Ledoux & Co., of Montreal, makers of carriages. They show a number of vehicles of various sorts, both for winter and summer, which would compare favorably with those turned out from any other factory.

Keeping along under the gallery, we come across a number of ice boxes and refrigerators for the preservation of destructable articles of food. These are exhibited by Geo. W. Reed, and we notice among them several models of ice boxes which are likely to prove useful in the sick room. Further along we notice some very handsome brass and iron bedsteads, manufactured and exhibited by H. R. Ives and Co. While we are standing looking at these we overhear a lady openly expressing her admiration for one of the brass bedsteads, and the attendant kindly offered to give it to her provided she would carry it home, an offer which, strange to say, she did not seem to be particularly thankful for. The same firm also manufacture a very ingenious folding bedstead made entirely of metal, and which is intended to replace the familiar but dangerous mantle-bed. Geo. Gale & Sons also exhibited bedsteads, their specialty being the manufacture of hospital beds upon what is known as the Lawson-Tait model. The principal peculiarity of this is in the spring, which is so arranged, mechanically, that it gives the greatest amount of easy motion with the least amount of sagging,

The firm of John Burns had a full line of stoves and ranges, as well as heating apparatus of all sorts.

Schieffelin & Co. exhibited their coal tar derivatives, antiseptic soaps, and a full line of their pharmaceutical products in the shape of pills, which are of a very high grade.

The Robert Mitchell Co., of Montreal, showed a number of very artistic gas and electric light fixtures, and next to them the Alpha Rubber Co. of Montreal have a large number of specialties made out of rubber: syringes which produce an absolutely continuous flow with one bulb, atomisers, operating aprons, air pillows and rings, and a great number of other articles.

As we turn round the end of this table we come to a regular "Booksellers row." First there is P. Blakiston, Son & Co.; next to them the J. B. Lippincott Co., whose Dominion agent is Charles Roberts, of Montreal, and next again Young J. Pentland, represented by Wm. Drysdale & Co., of Montreal. Lea Brothers & Co., of Philadelphia, and J. A. Carveth & Co., of Toronto, also have a number of books on exhibition. This seems a very popular part of the exhibition to the professional visitor, judging from the number who linger here examining the books.

The American Biscuit Manufacturing Co. are the manufacturers of what they call the Samatose Biscuit for dyspeptics and convalescents. This contains 10 per cent. of samatose, which is a dry extract of meat, and the biscuits serve for both a diet and a food. Bernhard Lindman exhibited the truss of which he is the inventor and manufacturer, and an excellent appliance it is. It is designed on good principles, and rests solely on its pads, applying the force in the direction in which it will do most good. The Hot Appliances Co. of New York are the proprietors of the Geyser Hot Appliance, which is a most ingenious method of applying heat to the body for the relief of pain. It consists of a small boiler with a self-regulating lamp, a rubber coil for application to the body, and rubber feed and return pipes. The ingenuity of the arrangement is most captivating. An appliance for the relief and cure of flat foot is the Improved Instep Arch Supporter of George G. London, of Boston. It is intended to be worn inside the boot, and is likely to prove a great help in the milder forms of this malady.

Going across the hall we find still more marvels to engage our attention. John D. Duncan, of Montreal, who is a licensee for the Walker Gordon Laboratory, demonstrated their method of modifying cow's milk in order to make it more suitable for the feeding of infants. J. Stevens & Son, whose agent in Montreal is W. H. Chap-

man, exhibit a line of antiseptic surgical dressings and sutures neatly and conveniently packed. They also show surgical instruments, knives, needles, scoops, antitoxin syringes, and everything that is necessary for the surgeons' armamentarium. The Galvanic Battery Works Co., of Toronto, have the same agent in Montreal. They exhibit batteries, both wet and dry, electrodes of all sorts, rheostats. An ingenious instrument for electric massage is also seen here. This is Hodgkin's Electric Neurotone, which is recommended in neurasthenia and in painful affections of the nerves.

Welch's Grape Juice is prepared from choice Concord grapes, carefully pressed and sterilised so that the rich colour, fine flavour and medicinal properties of the grapes are preserved. It is without alcohol, no water is added and it is always in new clean bottles.

Lyman, Sons & Co., exhibited hospital glassware of which they have the largest stock in Canada. Surgical instruments, aluminium ether cones, chloride of silver batteries, microscopes by Leitz and many other instruments and appliances, also the fine chemicals manufactured by Howard & Sons.

An exhibition of X-Ray apparatus was given by the Fessenden Manufacturing Co., and this wonderful new aid to diagnosis excited a good deal of interest. They showed the tubes, coils and rheostats in various forms as well as Fluoroscopes. Odell Bros., had a very ingenious filter in which the filtering material consists of a piece of porcelain very much after the method of the Pasteur Filter but somewhat cheaper and equally serviceable. A number of pumps for the compressing of air by means of water pressure was shown by the S. B Chandler Co., of Toronto, also the compressed air cylinders, pressure regulators and various spray-producing appliances.

The feeding of invalids came in for a good deal of attention in this exhibition and justly so, for it is a matter which most intimately concerns the welfare of our patients. Brand & Co., had a full line of their specialties for invalids, essences and extracts of various kinds of meat, concentrated broths and beef tea, meat lozenges, etc. Then the Vimbos Co., whose preparation "Vimbos" is put up in lozenges and various other portable forms. The Invalid Bovril is specially prepared for use in the sick room and is put up in porcelain jars. It contains all the nutritive constituents of lean beef. The Bovril Lozenges are the same thing more highly concentrated so as to contain the greatest amount of food in the smallest possible bulk.

When one sees the name of Henry K. Wampole & Co, one naturally thinks of their tasteless Cod Liver Oil, so well-known is this preparation. Their specialty is the exceedingly pleasant way in which

their medicines are disguised, making them very palatable and easy to take. They exhibited a large number of such specially prepared articles. The California Fig Syrup Co., exhibited the preparation from which they take their name. This has the reputation of being a very efficient and pleasant laxative. A preparation which has quite recently been placed on the market and which is making a strong bid for popular favour, is Abbey's Effervescent Salt. This is a pleasant effervescing aperient intended to take the place of the various nauseating mineral waters.

J. H. Chapman, Montreal, has certainly a very beautiful display of surgical instruments and apparatus, and as it was most tastefully and artistically got up, occupying also a prominent position near the centre of the rink, it proved a drawing card to judge by the doctors who thronged around it. Many of the articles shown were of quite recent design and all appeared to be of fine quality and finish; among those we noticed were, Hoppe's Universal Splint; Serum syringes of many patterns; Schimmelbusch's Portable Steriliser for instruments and dressings; Anatomical preparations from Tramond of Paris; Metzgers Centrifugal Machine for urine and blood; Hayem & Nachets Hæmatimetre; Whitman's Plates for flat feet; but there were so many equally interesting articles that we could go on "ad infindim" if space would permit. Mr. Chapman is Canadian agent for a number of English and French manufacturers, among whom is M. Nachet of Paris, who sent out a special exhibit of his microscopes, which was the finest ever seen here. In deformity apparatus, trusses, supporters and belts, operating tables, etc., all of his own manufacture, the display was excellent, and the goods certainly appeared to be much more durable than those made in the United States or Germany.

SPECIAL NOTICES.

ALASKA FEATHER AND DOWN CO., 290 Guy Street, Montreal.—Manufacturers of elastic felt mattresses. This mattress is recommended for hospitals and all institutions where sanitary material is desirable. Send for particulars.

THE LONDONDERRY LITHIA WATER CO., Nashua, N.H.—The purity and general excellence of this water makes its universal use the strongest testimony to its high quality.

ANGIER CHEMICAL CO., Boston, Mass.—Angier's Petroleum Emulsion, palatable, creamy and received by the most sensitive stomachs without any disturbance, is at once a valuable expectorant. Literature on application.

THE DOW PORTABLE ELECTRIC ASSISTANT CO., Brain ree Mass., A. E. Putnam, 100-102 Confederation Life Building, Toronto, Canadian Agent.—Internal illumination, galvanic and faradic current, and electrolosys. Valuable in diagnosing. Send for particulars.

GEORGE BARRAT, Optician, 259 St. James Street, Montreal.—Oculists' prescriptions carefully filled. Write for catalogue.

GEORGE TIEMAN & CO., Park Row, New York.—Surgical instrument makers, also hard rubber covered steel ecliptic insoles. Write for circulars.

TURKISH BATHS HOTEL, 140-144 Monique Street, Montreal.—Bathing apartments (other than Turkish) also marble swimming baths free to guests. Rates, $2.00 per day.

NAP. TOURANGEAU & CO., 718 Craig Street, Montreal.—The Tourangeau system of artificial limbs superior to all others for lightness, durability and cheapness. Specialty, crutches of every description. Send for catalogue.

EIMER & AMEND, 205-211 Third Avenue, New York, N.Y.—Manufacturers and importers of chemicals and chemical apparatus.

STALLMAN & FULTON, 10 Gold Street, New York, N.Y.—Sole agents for the United States and Canada for Nosophen, Antinosine and Eudoxine, the ideal antiseptics for every field of practice. Sample and literature gratis.

ROBERT DALGLISH, 22 St. John Street, Montreal.—Sole agent for the Dominion of Canada for Louis Roederer, Reims, the old reliable champagne, the finest wine exported from France. Highly recommended by the medical profession.

VAPO CRESOLENE COMPANY, 69 Wall Street, New York.—Evans & Sons, Limited, sole agents for the Dominion. For sufferers from whooping cough or croup. An efficient remedy and preventative from diphtheria, scarlet fever and bronchial troubles. Descriptive booklet with price list on application.

WALLACE DAWSON, Chemist, Montreal.—Manufacturer Royal Emulsion. Absolutely the most stable, palatable preparation of Cod Liver Oil prepared.

NEW ENGLAND VACCINE COMPANY, Chelsea Station, Boston, Mass.—Vaccine virus, pure and reliable. 60 paged new illustrated pamphlet mailed free.

W. L. CHIPCHASE, 639 Craig Street, Montreal.—Surgical instruments ground and repaired. Mail orders promptly attended to.

JACOB J. TEUFIL & BRO., Philadelphia.—Manufacturers of surgical, dental and veterinary instruments.

A. A. MARKS, 701 Broadway, New York.—Marks' improved rubber hands and feet are natural in action, noiseless in motion and the most durable in construction. Send for catalogue.

DE LOSEY HOLDEN CHAMPAGNE.—Gillespie & Company, Montreal, agents for the Dominion of Canada.

DR. FRANCIS C. MARTIN, Roxbury Station, Boston, Mass.—Yaccine virus.

The illustrations appearing in the description of the exhibits in the museum of the British Medical Association are from cuts kindly loaned by the *Montreal Pharmaceutical Journal Company.*

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI. NOVEMBER, 1897. NO. 5.

THE MONTREAL GENERAL HOSPITAL AND THE CIVIC HOSPITAL.

When the governing body of an institution is changed it is the natural course to review the results which have been obtained during its administration and to forecast as to the probable success which will accrue from the change.

Following this idea it is in order for us to consider the work done by the Montreal General Hospital while in charge of the Civic Hospital for contagious diseases. The arrangement whereby the Hospital assumed this care for the city was terminated by the city in August last.

On May 3rd, 1895, the Civic Hospital was opened to the General Hospital and by May 9th, the building was prepared and the first patient admitted. From that date till May 13th, 1897, there were treated 598 cases, 405 being of diphtheria and 193 of scarlatina.

The greater interest attaches to the treatment of diphtheria, as here, for the first time in Montreal, was antitoxin used regularly and methodically, and its effects studied and noted in a large number of cases.

The period of occupancy is divided by two changes in the personality of the resident physician and the results are shown to be as follows: During the first twelve months there were treated to conclusion, 158 cases of diphtheria with 13 deaths, a mortality of 10.1 per cent.; of these, 22 showed marked signs of laryngeal involvement and the mortality in these was 22.7 per cent. Of the laryngeal cases, 6 required intubation and 4 trocheotomy, with or without an intermediary intubation. The mortality was respectively 16.6 per cent. and 50 per cent.

With greater experience in the treatment by antitoxin and an increase of public confidence in the hospital the second period of twelve months shows the treatment of 216 cases with 21 deaths, a mortality of 9.7 per cent. Laryngeal cases 26, deaths 9. Mortality 34.6 per cent. Intubations, the majority of which were performed prior to the child being sent in to the hospital, 10, deaths 7, mortality 70 per cent. One trocheotomy which died.

From May 13th, 1897, to Aug. 13th, 1897, 31 cases were treated with but one death, a mortality of 3.1 per cent. Laryngeal cases 3, all intubated, all recovered.

Taking the period of occupancy as a whole there were admitted and treated to a conclusion, 405 cases of diphtheria with 35 deaths, a mortality of 8.6 per cent.

Such results have seldom been equalled and, one might say, never surpassed by all the flood of statistics which has been accumulated by the believers in antitoxin.

The treatment of scarlatina shows good but not remarkable results. In the first summer there was an approach of an epidemic and two of the Infants' Homes of the city furnished the majority of the severe cases. There was a total number of 193 cases treated, with a mortality of 15.5 per cent.

SMALLPOX IN MONTREAL.

The smallpox outbreak in Montreal, which at one time assumed a serious aspect, due in great measure to the difficulty experienced by the City Health Authorities in locating the origin of infection, which still remains undiscerned, now loses some of its importance in the fact, that the latest reports prove decisively, that the disease has been fought to a most satisfactory conclusion, no new cases having been reported to the authorities for one month since the removal of the last patient to the Civic Hospital, the period of incubation being thus safely passed. A fact worthy of note, is the occurrence of a fresh case, three weeks subsequent to the removal of the previous case to the hospital, there apparently being no common source of infection. The disease throughtout has assumed a varied type, although for the most part severe, no occurrence of the hæmorrhagic form has been reported. In regard to vaccination, the percentage has been satisfactory considering the mildness of the epidemic, about fifty-five thousand points having been utilized. We are pleased to note the few instances of resistance to the ordeal, which so characterised former outbreaks of the disease.

The following table gives the present status of the disease in the city and suburbs.

THE PRESENT STATUS OF SMALLPOX IN MONTREAL AND SUBURBS.

Municipality.	Date of Outbreak.	Total cases since Outbreak.	Died.	Recovered.	Still Sick.
Montreal, City.....	2nd July..	17	9	4	4 (a)
Westmount	26th July..	5	1	4	0
Ste. Cunegonde.....	28th Aug..	1	.....	....	1 (a)
Total	.....	23	10	8	5

(a) In the desquamating period.
N.B.—No more cases since Oct. 4th, 1897.

McGILL MEDICAL SOCIETY OF UNDERGRADUATES.

OFFICERS :—Hon. President, Dr. F. J. Shepherd; President, W. L. Barlow, B.A.; Vice-president, S. A. Banfill; Secretary, W. S. Galbraith; Assistant-Secretary, W. A. Wilson; Treasurer, W. A. Wilkins; Pathologist, D. A. Whitton; Reporter, H. B. Cushing, B.A.

COUNCILLORS :—Dr. Martin, Dr. Evans, H. Ross, B.A.

PROGRAMME COMMITTEE :—S. A. Banfill, W. S. Galbraith, H. Ross, B.A.

The following programme has been arranged for the meetings during the coming session :

FRIDAY, October 8th—1, Paper, "Gastric Ulcer." W. L. Barlow, B.A.; 2, Paper. "Functional Dysmenorrhœa," S. A. Banfill; 3, Paper, "The Bearings of General Biology and Embryology on Physiology and the Science of Medicine, E R. Secord; Exhibition of Pathological Specimens.

FRIDAY, October 22nd—1, Paper, "Summer Diarrhœa of Infants," H. B. Cushing, B.A.; 2, Paper, "Pigmentations, Physiological and Pathological," W. H. Dalpé, B.A.; 3, Paper, "Differences in Blood for Different Groups of Animals," J. E. M. Carnwath; Exhibition of Specimens.

FRIDAY, November 5th—1, Paper, "Gonorrhœa in the Male," S. M. Dickson, B.A.; 2, Paper, "Post-partum Hæmorrhage," G. S. Tiffany; 3, Paper, "Paranoia," F. T. Tooke, B.A.; Reporter's Statement; Exhibition of Pathological Specimens.

FRIDAY, November 19th—1, Paper, "The Pulse in Disease," C. Ogilvy, B.A.; 2, Paper, "The Puerperal Breast," J. West, M.A.; 3, Paper, "The Physician a Naturalist," R. F. Beattie; 4, Paper, "The Relation of Evolution to Physiology," L. G. Cameron; Reporter's Statement.

FRIDAY, December 3rd—Debate : Resolved, "That the usual treatment of typhoid, more especially as regards hydrotherapy and milk diet, is faulty." Speakers in affirmative, R. G. Duncan, H. R. Macaulay; speakers in negative, C. Davidson, C. A. Peters.

FRIDAY, December 17th—Address, Dr. A. D. Blackader.

FRIDAY, January 7th—1, Paper, "Herpes : Cause, Distribution and Treatment," J.

W. Blackett, B.A.; 2. Paper, "Pupura Hæmorrhagica," C. H. Brown, B.A.; 3, Paper, "Hernia," J. A. Lamb; 4, Paper, "The Relation of Physiology to Athletics," E, F. Murphy; Exhibition of Pathological Specimens.

FRIDAY, January 21st—1, Paper, "The Face and its Expression," B. W. Gillies; 2, Paper, "The Sputum in Disease," F. W. Harvey, B.A.; 3, Paper, "Muscular Development and its Relation to Health and Disease," F. J. Haszard; Exhibition of Pathological Specimens; Reporter's Statement.

FRIDAY, February 4th—1, Paper, "Tabes Dorsalis," A. M. Smith, B.A.; 2, Paper, "The Significance of Fever," N. Grace; 3, Paper, "Salivary Secretion," F. J. Nicholson, B.A.; Exhibition of Pathological Specimens; Reporter's Statement.

FRIDAY, February 18th—Debate: Resolved, "That in Eclampsia the uterus should be emptied as rapidly as possible." Speakers in affirmative, R. U. Patterson, R. B. Deane. Speakers in negative; R. Telford, J. N. MacLean.

FRIDAY, March 4th—1 Paper, "Causes of Jaundice." L. J. O'Shaughnessy; 2, Paper, "Biology: its Relation to Medicine and Surgery;" F. S. Jackson. This paper will be illustrated by lantern views.

FRIDAY, March 18th—Closing Address, Dr. F. J. Shepherd.

PRIZE COMPETITION.—The Medical Society offers this year a first and second prize in senior subjects. Competition open to all undergraduates; and a first and second prize in junior subjects. Competition open to junior years only. For further particulars refer to the by-laws.

LIBRARY OF THE PROVINCIAL BOARD OF HEALTH.

We have received from the Board of Health of the Province of Quebec a catalogue of their library. We learn from the officials of the Board that the medical profession is invited to make use of books there, and the catalogue will be furnished on application. We note among the volumes catalogued a number not hitherto accessible in any of our libraries, such as the complete series of the Registrar General of England's statistical reports, the complete series of the reports of the Local Government Board, (which forms a complete record of the modern sanitary history of Great Britain) and also the complete file of the Annales d'Hygiene publique since its commencement in 1827, which is the best record of the sanitary and medico-legal progress in France. A fair collection of the standard works on sanitary subjects in the English and French languages, as well as a number of sanitary reports, monographs and pamphlets are also listed.

It is to be hoped that some of the other scientific libraries in Montreal will endeavour to issue catalogues of each book or journal registered in a printed catalogue, which will be of more service to the profession than twenty which can only be learned of by making a personal voyage of discovery to a library. The admirable plan which has been followed in some American cities of cataloguing not merely

books in the public libraries, but also, in addition, obtaining from private owners, lists available in private libraries, of writers in their possession not in the library catalogue. If carried out here this would, without any additional expense, greatly enhance our present facilities for literary research. An inter-library association is much needed.

Circular No. 4.

LABORATORY OF THE BOARD OF HEALTH,
OF THE PROVINCE OF QUEBEC,
MONTREAL, October 1st, 1897.

To the President of the Board of Health of the Province of Quebec:

SIR,

The simple technique recommended by this Laboratory for the serum diagnosis of Typhoid, by means of dried blood, has been found, after a year's trial, quite satisfactory for the practical work of diagnosis.

At the same time, (as was recently explained by a Committee of the American Medical Association, of which I was a member) although for routine diagnostic work even the very simplest methods may give good practical results, yet for recording scientific observations quantitative methods should be selected. This is especially necessary in reporting exceptional cases at variance with the general results of others, or where the observations are made the basis of generalisations.

I have found that good uniform quantitative results can be readily obtained with the dry blood method by taking in the first instance drops of uniform size, collected by means of a wire loop (I use 20 guage copper wire 2 mm. inside diameter), which is returned with the outfit, and used subsequently to obtain dilutions of known strength. The method has been described more fully in a joint paper by myself and Dr. Harold Thomas before the British Medical Association at Montreal, on Sept. 2nd, 1897.

For quantitative work, the blood is dried on an ordinary glass slide, or non-absorbent paper can be used if preferred. One of the outfits will be sent, when a quantitative estimation is desired, or to any who are practically interested in the matter. As already stated, I do not find quantitative work necessary for routine diagnosis, preferring to employ cultures having a sensitiveness so low as to give no reaction at all with non-typhoid blood.

In addition to the previous observations made by myself and Dr. D. D. McTaggart as to the use of attenuated cultures, I wish further

to call attention to the importance of paying special care to the reaction of the test culture media. Bouillon cultures showing after 24 hours growth of typhoid at 37° C., a slight uniform cloudiness only, and quite free from scum or sediment, offer the greatest security against pseudo-reactions. I find that such cultures can be obtained by using bouillon just on the verge of litmus acidity, giving no blue whatever to the red paper. From 3 per cent. to 4 per cent. of normal alkali (I employ 3·5 per cent.) are required to make this bouillon neutral to phenol phthalein.

Cultures which give a heavy bouillon growth are the ones which are most liable to give pseudo-reactions, *i.e.*, to clump in a deceptive manner spontaneously or with non-typhoid blood. If the culture is too acid the reaction may be defective. With a proper culture, I have never met with the typical reaction apart from typhoid fever. On the other hand, by employing certain incorrect methods of preparing the culture I can obtain at will very perplexing pseudo-reactions with a large proportion of non-typhoid bloods. This may be the explanation of a number of anomalous published results, though the difficulties can be also doubtless avoided by other means than those indicated here.

I have the honour to be, Sir,
Your obedient servant,
WYATT JOHNSTON,
Bacteriologist to the Board.

INFANTILE SCURVY.

The American Pediatric Society is making a Collective Investigation of Infantile Scurvy as occurring in North America, and earnestly requests the cooperation of physicians, through their sending of reports of cases, whether these have already been published or not. No case will be used in such a way as to interfere with its subsequent publication by the observer. Blanks containing questions to be filled out will be furnished on application to any one of the committee. A final printed report of the investigation will be sent to those furnishing cases.

(Signed).

J. P. Crozer Griffith, M.D., Chairman, 123 S. 18th St., Phila.
William D. Booker, M.D., 853 Park Ave., Baltimore.
Charles G. Jennings, M.D., 457 Jefferson Ave., Detroit.
Augustus Caille, M.D., 753 Madison Ave,, New York City.
J. Lovett Morse, M.D., 317 Marlboro St., Boston.

Committee.

Dr. Adami, Professor of Pathology in McGill University, has been invited by the University Medical College of New York to deliver a course of lectures on general pathology, and has accepted the invitation. He gave his first lecture on October 15th.

In the *Viertal Jahersche f. Gerichtiche Medicin* supplement for 1897, is the text of a recent order by the Prussian Government permitting the sale of beef containing cysticerci (measly beef) which has been kept for twenty-one days in cold storage, the researches of R. Ostertag having shown that after this period the cysticerci in the raw meat were no longer in a condition capable of conveying infection. A number of personal tests were made, all with satisfactory negative results by Ostertag and his pupils. The report recommending this innovation is signed by Virchow.

The office of the Institut International de Bibliographie has been moved to 93 Boulevard Saint-Germain. To this address should be sent all letters, etc., intended for this Journal.

The office of the Montreal Branch of the British Medical Association has been removed to the rooms of the Montreal Medico-Chirurgical Society, 2426 St. Catherine Street.

Dr. F. A. L. Lockhart has been appointed Gynæcologist to the Montreal General Hospital. He has also assumed charge of the private hospital of the late Dr. Alloway.

Dr. J. D. Cameron has been appointed Assistant Gynæcologist to the Montreal General Hospital.

Obituary

THOMAS JOHNSON ALLOWAY.

It is our painful duty to have to record the death of our esteemed colleague, Dr. Thomas Johnson Alloway, Associate Professor of Gynæcology in McGill University and Gynæcologist to the Montreal General Hospital.

Doctor Alloway was born in Queen's County, Ireland, in 1844, and came to this country with his parents at an early age, his father the late Captain Arthur Alloway, being a retired officer of H.M. 4th King's Own. His early education was received in Montreal, and he graduated in medicine in McGill, in 1869. He proceeded immediately to Edinburgh, where he qualified himself for a position in the Royal Navy, by passing the conjoint examination of the Royal College of Physicians and Surgeons. While waiting for an appointment, he spent a year as resident surgeon of the Wandsworth Infirmary. Later, he was attached as assistant surgeon to H.M.S. Hercules of the Channel fleet, where he served for a period of three years. He then returned to Montreal, and entered into general practice. For a number of years he was connected with the Montreal Dispensary, as gynæcologist; resigning in May, 1887, when appointed assistant surgeon to the Montreal General Hospital; and two years later, having decided to devote himself exclusively to gynæcology, he was appointed assistant gynæcologist to that institution. On the resignation of Dr. William Gardner, to accept his present position in the Royal Victoria Hospital, Dr. Alloway was appointed in his place as gynæcologist-in-chief. He continued in that capacity up to the time of his death, and in fact performed an important and difficult operation only three days before. He became attached to McGill Medical Faculty as demonstrator in gynæcology and was rapidly promoted to the position of lecturer, assistant professor and associate professor.

For many years Dr. Alloway occupied a leading position among the practitioners in Montreal. While in general practice, he was esteemed highly both by his professional brethren and by the general public. It was, however, as a specialist in gynæcology that he developed those traits which will make him long remembered. As an operator he was distinguished for his caution as well as his boldness. His many triumphs in the field of uterine surgery were not the result of reck-

lessness, but the outcome of long and careful preparation and attention to details. He was dexterous to a degree, and always ready to meet the most unlooked-for emergencies with a confidence born of an intimate knowledge of the subject which he had so much at heart. As a teacher he was clear, impressive and enthusiastic. He had the faculty of communicating to his students that intense interest which he himself felt in his work—the best of all evidence of a good teacher. To his many friends, especially those in the profession, his death will come as a deep personal loss. His kindly, gentlemanly ways made him many friends.

His devoted wife and daughter have in the profession in Montreal and elsewhere many sympathisers in their affliction.

RICHARD NORRIS WEBBER, M.D.

By the death of Dr. Webber, which took place on Aug. 11th last, the town of Richmond lost one of its oldest and most respected citizens:

He was born in Concord, Vt., seventy-five years ago, lived in St. Johnsbury and other towns in Vermont, and finally in 1832, came to Stanstead, Que., with his parents, where he received his early education.

In 1844 he commenced the study of medicine in the office of the late Dr. Colby of Stanstead, father of the Hon. C. C. Colby. In 1846, he entered Harvard University and while he was there ether as an anæsthetic was first introduced, and he witnessed in the operating theatre of the Massachusetts General Hospital, the second operation ever performed under ether, the operation being amputation of the lower third of the thigh, the operators being Bigelow and Warren.

He then left Harvard and went to Bowdoin College, Brunswick, Me., in the fall of 1846, and graduated M.D. in the spring of 1847, the subject of his thesis being Ether Anæsthesia, for which he received great praise from his professors. He came to Richmond in June, 1847, and for fifty years practiced his profession there and in the surrounding country,

His early experience would make the modern graduate quail. There being no roads, horseback was the only means of travel and very often he had to walk miles on foot. He acquired an extensive practice, covering a territory of over 20 miles in every direction from Richmond. He was the poor man's friend and would respond to calls night and day, even when he knew there was no fee in view. For a man of his time he was well up in his profession but preferred the older to the more modern plans of treatment. He possessed an iron constitution and an iron will and usually carried out whatever he

undertook. He was a mathematician of the highest order. Had good judgment. He possessed a ready wit and had an answer for everybody. He was a public spirited citizen, taking great interest in matters political and municipal, acting in the various capacities of Mayor, Councillor, School Commissioner, &c. He took a great interest in educational matters, being one of the founders of St. Francis College, Richmond, and continued its firm friend up till his death. He was a great advocate of temperance and opposed vigorously the use of alcoholic stimulants in his practice. He gave his hearty support to every good cause, and he died without a blemish on his character, beloved and respected by every body, and truly it may be said of him " he rests from his labours and his works do follow him."

A. D. S.

NEW BOOKS, ETC., RECEIVED AND NOTED.

American Academy of Railway Surgeons. Vol. III., 1898. Edited by R. Harvey Reed, M.D., Columbus, Ohio.

International Clinics. Vol. II. Seventh Series. July, 1897. J. B. Lippincott Co., Philadelphia.

The Roentgen Rays in Surgery. By Carl Beck, M.D. Reprint from International Medical Magazine, June, 1897.

The Treatment of Complicated Ulcers of the Cornea. By Clarence A. Veasey, A.M., M.D. Reprint from Therapeutic Gazette, July 15, 1897.

The Appendix " in the Interval"—A new Method of Studying its Pathology. By Robert Abbe, M.D., N.Y. Reprint from Medical Record, July 10th, 1897.

The Liverpool Medico-Chirurgical Journal with proceedings of the Liverpool Medical Institution. July, 1897.

The Treatment of Alcoholism. By J. M. French, M.D. Reprint from Medical and Surgical Reporter, September and December, 1896, and May, 1897.

Bulletin 53. Report on Crops, Live Stock, etc., in Manitoba. Winnipeg, August 20th, 1897. Issued by the Department of Agriculture and Immigration.

A plea for a uniform Diastase Test. By C. C. Fitem, M.D., Now York. Repirnt from Journal of American Medical Association, Aug. 28, 1897.

Tuberculosis of the Genito-Urinary Organs. By N. Senn, M.D., Ph.D., LL.D., Chicago. W. B. Saunders, Philadelphia.

The Physical Signs of Acute Bronchitis. By J. N. Hall, M.D., Denver. Reprint from the Medical Fortnightly, St. Louis, Mo., Aug. 2nd, 1897.

Phthisis Originating in Colorado. By J. N. Hall. M.D., Denver. Reprint from The Denver Medical Times, March, 1897.

Interrupted Respiration ; A study of certain Physical signs of Diseases of the Chest. By J. N. Hall, M.D., Denver, Col. Reprint from Journal of American Medical Association, July 17th, 1897.

A case of double pulmonic murmur with diastolic thrill. By J. N. Hall.

The Relation of Oxaluria and Uric Acid Excess to Genito-Urinary Inflammation and Disorders. By Bransford Lewis, M.D., St. Louis, Mo. Journal of Genito-Urinary and Cutaneous Diseases, July, 1897.

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INTRODUCTION TO THE DISCUSSION ON THE RELATION OF RHEUMATOID ARTHRITIS TO DISEASES OF THE NERVOUS SYSTEM, TUBERCULOSIS, AND RHEUMATISM.

BY

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Rheumatism in its acute and sub-acute arthritic and general manifestations, is a very common disease in this country; while rheumatoid arthritis is comparatively rare. I have been unable to collect any evidence as to its comparative frequency in Canada and the United States, and it is doubtful whether our more vigorous Canadian climate especially predisposes to it or not. It is well known that both in the United States and Canada, gouty arthritis is extremely rare. Of the few cases that I have met with, the great majority were in people who had previously lived in England, and who had suffered before coming to this country, or had a very strong gouty predisposition.

Owing to the kindness of many of my fellow practitioners in this city and the surrounding country, I have had an opportunity of studying during the past three and a half years in the wards of the Royal Victoria Hospital upwards of 40 cases of rheumatoid arthritis. An analysis of these cases is the chief foundation for the remarks that follow.

The number is small as compared with the experience of many physicians in England and the continent of Europe, but as far as I know it is the largest number that has been reported on from any one hospital on this continent.

Of the 40 cases, twenty were males and twenty females. Usually the proportion between males and females is about five to one.

There was a family history of some form of rheumatic affection in eight cases, of tuberculosis in five, and of a neuropathic tendency in four cases. Unfortunately, little stress for useful medical work can be laid on the family history obtained from hospital patients. Even well to do and educated people often give, although unconsciously, misleading information on such matters.

As to the exciting causes of rheumatoid arthritis the following were noted. There was a history of gonorrhœa in more than 30 per cent. of all cases occurring in males, and in three of the male cases there was a history of 2 or more attacks of gonorrhœa. In the female patients, however, there was with the exception of one case an entire absence of symptoms pointing to a past genito-urinary disturbance. For a long time it has been taught that there is an intimate connection between uterine disease and rheumatoid arthritis. In fact, a very ingenious theory as to the nature of the disease has been built upon this alleged connection. But next to gonorrhœa, exposure to cold was considered as the most likely exciting cause. It appeared to be the sole or chief cause in five of the forty cases, which may account for the fact that in Canada the disease is rather frequently met with in lumbermen. The next most frequent cause was worry. It was said to have been present in four cases. In all four cases the worry was of an unusually severe and prolonged character. In three cases alcoholism was at least a predisposing factor. Three patients had had subcutaneous abscesses, two had had double otitis media, two influenza and two tonsillitis. Typhoid fever, whooping cough and diphtheria were each in one case considered as being the chief cause.

In several cases two or more of the above mentioned causes were present, while in about 15 per cent. no cause could be ascertained. It will be noticed that in fully 50 per cent. of the cases the patient had previously had some infectious trouble, the most frequent being gonorrhœa, but only in two of the gonorrhœal cases was there a history pointing to gonorrhœal rheumatism. In both cases the gonorrhœal arthritis was confined to a single joint, but there afterwards developed a polyarticular rheumatoid arthritis. It appears as if the infection of one joint predisposed to a general joint affection. It is worthy of note that three patients had recently had subcutaneous abscesses and two a double otitis media.

I will now take up the consideration of the more immediate object of this paper viz., a discussion of the relations existing between nervous disease, tuberculosis, rheumatism and rheumatoid arthritis.

I. The *relation* between *rheumatoid arthritis* and *nervous disease.*

The peculiar joint affection met with in cases of tabes dorsalis first fully described by Charcot, presents many features both clinical and anatomical similar to those of rheumatoid arthritis. It was, I believe Remak who first, in 1863, drew attention to this striking resemblance, and who suggested the possible spinal origin of rheumatoid arthritis. Much has been written lately on the similarity. In the great majority of standard medical works of the present day, the favourite theory for the explanation of the disease is that it is brought about by changes in the spinal cord. But when the whole subject is carefully considered it is difficult to understand why such a view has become so popular. It certainly has no sufficient ground work to entitle it to be generally accepted as a full and true explanation of the nature of rheumatoid arthritis. The reasons usually advanced for adopting the nervous origin of rheumatoid arthritis, are these :

1. The fact, that in certain diseases of the spinal cord, as tabes, syringomyelia, progressive muscular atrophy, joint changes of a somewhat similar character are met with.

2. The very frequent early and pronounced muscular atrophy observed in cases of rheumatoid arthritis.

3. The history frequently obtained of causes, having a marked effect in lowering the resisting power of the central nervous system to disease.

4. The frequent onset of rheumatoid arthritis with symptoms of a nervous character, symptoms pointing to a central or peripheral nerve disturbance, and there can be no question that in a certain proportion of cases about the first symptoms complained of are tingling and numbness in the extremities. In 10 of my 40 cases such an onset was described, and simultaneously with this perverted sensory disturbance or soon subsequent to it, stiffness of the joints supervened.

The *neuropathic arthropathies.* In a number of well recognised lesions of the central nervous system marked joint changes are occasionally met with. They are probably more frequently seen in syringomyelia than in tabes dorsalis. They are rare in progressive muscular atrophy, hemiplegia and ataxic paraplegia.

The joint changes in tabes may take the form of atrophy or hypertrophy of the structures entering into its formation, or there may be atrophy of some parts and hypertrophy of others. Usually the onset is very sudden and painless, and a characteristic feature is sudden distension of one of the larger joints, the knee generally, from fluid effused in the synovial sac. This effusion may disappear after a time without permanently damaging the functions of the joint.

More frequently signs of disorganization become apparent. The cartilage is destroyed. The heads of the bones waste and sometimes bony overgrowths spring from the ends and they are also met with in the peri-articular structures.

Occasionally the limb becomes enormously enlarged from the excessive growth of bone, and as soon as the changes in the bones set in there is no tendency to repair. Clinically there is little or no difference between the joint affections of tabes and syringomyelia. Anatomically they also correspond. In a few cases of tabes the joints have been opened early in the disease, and in several cases of syringomyelia, where surgical interference was considered necessary early in the disease, good opportunities were presented of ascertaining the exact changes present in the joint before the destructive process had made much progress. The cartilage is found to be more or less destroyed and covered here and there with polypoid growths. In several cases the ends of the bones were diseased, there being usually a considerable increase in the cortical substance and a wasting of the spongy structure. The capsule is found greatly expanded from the accumulation of the polypoid growths which vary much in size, the smaller ones being soft and vascular and the larger ones hard in consistence and containing but little blood. Bony plates are also to be met with on the internal surface of the capsule. The above intracapsular changes are precisely like those met with in cases of rheumatoid arthritis that have been operated on early in this disease. There has been for some time a difference of opinion as to the structures first involved in rheumatoid arthritis, some contending that it first shows itself in the cartilage, while others think that it arises primarily in the synovial membrane. Early changes, however, are met with in both structures, which are indistinguishable from those seen in syringomyelia and in tabes. In nervous arthropathies effusion into the joints is more common and reaches a greater degree than it does in rheumatoid arthritis. The destructive process reaches a greater degree and runs a much more rapid course in the former than it does in the latter. The clinical difference between the two is much greater than the anatomical. Rheumatoid arthritis is attended by great pain, while the nervous arthropathies usually run a painless course. The limbs in the latter can be bent in all directions without causing any pain, the extreme flexibility of the joints being due to the stretching of the ligaments and other structures by the copious effusion into the joint.

Two different views are at present held as to the nature of the nervous arthropathies, one being that they are brought or by inter-

ference with the function of the so-called trophic centres for the joints in the spinal cord. It is claimed that the degenerative process in tabes and syringomyelia involves such parts in the spinal cord. The other view, and one that is steadily gaining ground, is that owing to the lessened or disturbed sensation so frequently met with in both tabes and syringomyelia, traumatic influences have much to do with setting up the inflammatory action, and according to this view it is not necessary to assume the presence in the cord of centres having a trophic influence over the joints, the destruction of which brings about the changes. In the great majority of cases of both tabetic and syringomyelic arthritis, a history of a fall or injury is obtainable. There is nothing special in the joint changes that could not be explained by an inflammatory action excited by an injury. The clinical difference is accounted for by the sensory disturbance in the joints, and all things considered, it appears more consistent with observed fact to explain the arthritis on the assumption of an injury than that it is brought about by the involvement of certain definite parts of the spinal cord.

The question of the cause and nature of the joint changes in tabes, syringomyelia, etc., is still a matter of doubt. It is unwise to speak too positively on this matter. There is, however, very strong ground for taking the view that the joint changes in rheumatoid arthritis are not due to disease of the spinal cord. Should such changes be brought about in that way, it is hardly conceivable that they should not present evidence of not only microscopic, but macroscopic changes in the spinal cord. In several cases the spinal cord has been examined in rheumatoid arthritis after death, and no abnormal appearances have been discovered Folli in two cases saw some wasting of the cells of the anterior cornua, but elsewhere nothing. Changes in the peripheral nerves have also been met with in a few cases, but neither the slight changes described by Folli or the nerve changes are constant, and, therefore, cannot be considered as sufficient causes of the joint changes in rheumatoid arthritis.

It is difficult to explain the marked and comparatively early atrophy of the muscles that occurs in rheumatoid arthritis. It does not correspond clinically to that met with in anterior polio-myelitis for we do not meet with any marked reaction of degeneration. The electric reaction is often normal, and is rarely more than slightly lowered. The view commonly held at present is that the wasting is brought about in a reflex manner. This theory receives support from the experiment of Raymond that division of the posterior spinal roots prevents wasting from taking place in joint disease. It must

be remembered that atrophy of the muscles takes place in all forms of chronic arthritis, and even in subacute cases; syphilitic and tuberculous and hæmophilic arthritis are frequently attended by atrophy. No matter what the cause is then, it must be due in the first place to some change in the joint, and not to any supposed changes in the spinal cord. It is in the first place an arthritic affection.

The fact that causes that are well known to bring about a lowered resisting power of the nervous system are often prominent in rheumatoid arthritis does not directly prove the involvement of the nervous system. Such causes act as well on the general nutrition as on the joints.

The not infrequent perverted sensory disturbance preceding the onset of rheumatoid arthritis has been advanced as tending to prove the nervous origin of the disease. I have never been able to ascertain that there was an objective disturbance of sensation in rheumatoid arthritis. No matter how extreme the muscular atrophy, it is not attended with any loss of sensation. Subjective disturbance of sensation is a frequent symptom of many general conditions, due generally to auto-intoxication from the intestinal canal, and its frequent presence in rheumatoid arthritis does not, as far as I can judge, lend much support to the neuropathic origin of this disease.

On the whole it must be considered that the evidence pointing to a nervous origin of rheumatoid arthritis is very meagre.

II. *The Relation of Rheumatoid Arthritis to Tuberculosis.*—Pulmonary and other forms of tuberculosis appear to be more frequent in the families of sufferers from rheumatoid arthritis than they are in other non-tuberculosis diseases. In the series of 40 reported cases such a history was only obtained in three cases, a proportion not greater, if as great as, in people in good health. Fuller, in a report on 119 cases of rheumatoid arthritis, found a history of phthisis in 23 cases. Charcot and several other observers have found tuberculosis of the lungs and lymphatic glands not infrequent antecedents in their experience. A few cases have been published where both diseases were apparently present at the same time, one joint being tuberculous, while others resembled the joint lesions of rheumatoid arthritis. There is, however, nothing in common between the two diseases, although in some respects there is a similarity between them. Tuberculosis is an infectious disease, prone to attack those who have an inherited predisposition to it. There is every reason to believe that rheumatoid arthritis is also of an infectious nature, nor is there any doubt that there is an inheritance of what we call an arthritic diathesis; that is an inheritance which involves a tendency to inflam-

mation of joints and fibrous structures. Indirectly, a tuberculous tendency may, by lowering the resistance, tend to bring about a rheumatoid arthritis, and it is only in this sense, as I understand it, that there is a connection between the two diseases.

III. *The Relation of Rheumatoid Arthritis to Acute, Subacute and Chronic Rheumatism.*—Is rheumatoid arthritis a frequent or an occasional continuation or result of an attack of acute, subacute or chronic rheumatism? This question is constantly being forced on every physician who sees much of this disease. In a very considerable proportion of all cases a history of acute or subacute rheumatism is forthcoming, but the vagueness with which the word rheumatism is generally employed, renders the clinical history of such cases far from exact. Making a certain allowance for this, there can be no question that a certain, even a very considerable number of cases that are indistinguishable in the beginning from acute rheumatism develop afterwards, it may be gradually or more or less suddenly, into rheumatoid arthritis. In four of my 40 cases of rheumatoid arthritis there was a very clear history of acute rheumatism. In two of the four cases, there were found the physical signs of organic disease of the heart. In one, a female, aged 35, there was both mitral and aortic disease. She was said to have had rheumatic fever at 10, and several subacute rheumatic attacks subsequently. When under observation in 1894, she presented all the marked symptoms of a poly-articular rheumatoid arthritis. In a second, a female, aged 70, was under observation during the early stage of her illness, which clinically was not to be distinguished from an ordinary attack of acute rheumatism. Early the physical signs of mitral disease were discovered, and after several relapses of the arthritis, the signs and symptoms of rheumatoid arthritis gradually developed. There can, I think, be no question that in both of these cases we have a rheumatoid arthritis gradually developing as the result of repeated acute rheumatic attacks. In neither case was there a history pointing to an hereditary tendency to rheumatism.

In thirteen cases, the onset resembled that of an ordinary subacute rheumatism, pain and swelling of the joints being the first and only prominent features of the early stage. The rule in such cases being that after lasting a few days the intensity of the symptoms subside, but only for a short time. Repeated attacks occur, till finally we have a fully established case of rheumatoid arthritis. In twelve cases the onset was very slow, with stiffness and swelling of one or more joints, coming and going till finally the condition was one of undoubted rheumatoid arthritis. In the great majority of the cases of chronic

onset some time passed before the characteristic changes of rheumatoid arthritis were developed.

It will be observed that in a very large proportion of the cases the beginnings of the disease were the same as in ordinary rheumatism. In at least 30 per cent. the onset was either that of acute or subacute rheumatism—the unavoidable inference being that a very intimate connection exists between rheumatoid arthritis and acute and subacute rheumatism. How is it that the great majority of cases of both acute and subacute rheumatism recover perfectly and that a few cases do not, but eventually go on to destructive changes in the joints. It is a well recognized fact that irrespective of the cardiac changes neither acute nor subacute rheumatism are followed by any permanent damage of the structures involved.

There is no recognised well marked dividing line between chronic rheumatism and rheumatoid arthritis.

We meet with all possible grades of difference from paroxysmal, slight pain and stiffness of one or more joints, up to cases in which nearly all the joints of the body are practically useless from destruction of their tissues and the formation of new bony tissue. We characterize the cases at one end of this scale as chronic rheumatism, and at the other end as rheumatoid arthritis. But the naming of the cases that we meet in the borderland between these two extremes is a difficult matter. One and the same case may be called by competent observers, chronic rheumatism or rheumatoid arthritis. This goes to show that there is nothing distinctive about the clinical features of these cases. It is only in marked types of rheumatoid arthritis that a diagnosis is easily made, and one that would be accepted universally.

In Germany and France it is the custom to call cases chronic rheumatism which in England would be called rheumatoid arthritis. There are no anatomical differences between borderland cases of chronic rheumatism and rheumatoid arthritis. In both we find distension of the capsule from polypoid growths and the accumulation of serum.

There are grounds for hoping that the bacteriological examination of the joints may help to clear up the difficulties surrounding the nature of chronic rheumatism and rheumatoid arthritis.

As yet we have no absolute proof of acute rheumatism being due to a micro-organism; there are strong reasons, however, for believing that such is the case. Riva, of Parma, in a recent paper has made a very important contribution tending to prove the infectious nature of this disease. Until comparatively recently there was no evi-

dence pointing to the microbic origin of rheumatoid arthritis, but from the bacteriological researches of Schüller of Berlin, Bannatyne and Blaxall, and of Chaufford and Ramond, it is highly probable that we have here to do with an infectious disease. The acute and subacute poly-articular forms of rheumatoid arthritis have all the clinical characters of an infection. Schüller, who has practised arthrectomy in many cases of rheumatoid arthritis, has examined the tissues for micro-organisms and has constantly found a small bacillus present and occasionally an agglomeration of micrococci. He has also made cultures from the fluid in the joints removed by tapping. He found bacilli develop on various media. The best stain is carbolised fuchsin. Inoculation into the knee of a rabbit produced an arthritis resembling that of chronic rheumatism, but without any changes in the cartilages or bones.

Drs. Bannatyne and Wohlmann, of Bath, working with Dr. Blaxall, of London, have demonstrated the presence of an organism which is said to be constant in its characteristics. It is a very small bacillus, presenting marked polar staining. It was found present in the synovial fluid in 24 out of 25 cases examined. It was also found in the blood in three out of five cases. A bacteriological examination was made of the synovial fluid from joints diseased from other causes with a negative result as far as the special bacillus is concerned. The observers have not succeeded by re-inoculation as yet in producing the original disease in animals.

Chaufford and Ramond have still more recently found in the synovial fluid in cases of rheumatoid arthritis a diplo-bacillus. They also found the same organism in the swollen lymphatic glands in the neighbourhood of the diseased joints, but did not succeed in cultivating the bacillus.

Much work yet requires to be done in the bacteriology of this disease before a true estimate can be made of the value of the researches referred to. In some points they all lack in the extreme care that such work demands, and before they can be accepted the work must be repeated by different observers.

Prof. Bäumler, of Freiburg, the most recent writer on this subject, considers that it is highly probable that the disease is of an infectious nature. At the recent meeting in Berlin of the Congress for Internal Medicine, he read a very able paper on the subject.

I will conclude with the following summary of the chief points in this discussion.

1. Rheumatoid arthritis is a disease prone to occur in people of a rheumatic tendency, and who have suffered from sub-acute rheumatic

attacks. The presence of infectious disease of any kind tends to increase this tendency, as does also the operation of all causes having a depressing influence on the resisting power of the nervous system (worry, exposure to cold, and traumatism.)

2. There is no sharp dividing line between certain cases of chronic rheumatism and the earlier stages of rheumatoid arthritis.

3. There is not sufficient evidence to support the views commonly held, as to the nervous origin of rheumatoid arthritis.

4. There is no direct relationship between tuberculosis and rheumatoid arthritis.

5. The polyarticular forms of rheumatoid arthritis have clinically the features of an infectious disease.

6. The result of recent investigations points very strongly to its infectious nature.

I have only a few words to say on the treatment of the disease, especially on the treatment by super-heated air baths.

It is universally recognized that the medicinal treatment is very unsatisfactory. Whether surgical interference will ever become practically applicable is difficult to say. There appears to be a field for surgery in these cases. Schüller, of Berlin, and other German surgeons have published results which certainly tend to make one think that much may be accomplished in this way. Something also may be accomplished by the injection into the diseased joints of various antiseptic agents. Reports by Schüller and others on this way of dealing with the disease are more or less satisfactory.

At the present time the most universally applicable and successful method of dealing with early rheumatoid arthritis is by means of baths of various kinds.

The Scotch douche is in certain cases a very valuable means. It consists in the direct application of an alternating stream of hot and cold water. It promotes the absorption of the exudations into the joint, and it also relieves pain.

Dry baths are, however, generally more effective than moist ones. The dry sand bath has for a long time been used with more or less success. But in my opinion the most valuable of all methods of treatment is the use of baths of super-heated dry air, after the Tallerman method. It has been used in 20 cases of rheumatoid arthritis in the Royal Victoria Hospital during the past nine months with gratifying results.

The apparatus consists of a copper cylinder, of various shapes and sizes. The usually employed model is sufficiently long to admit a lower limb to some inches above the knee. By means of valve taps the

moisture from the limb is expelled, so that the air in the chamber is kept dry. The temperature in the chamber is kept usually from 240° to 300°. The first marked effect is copious perspiration all over the body. The pulse is increased from 15 to 30 beats, and the temperature is usually elevated from 1° to 2°.

In all we have treated twenty cases with the hot air bath. In fourteen of the twenty cases pain in the affected joints was present and of a severe character. In the great majority of the cases the relief was marked even after the first bath, and after several baths the patient, except on movement, was practically free from pain. As a result of this relief, sleep, which usually before was greatly disturbed, becomes possible. In addition there was some apparent change for the better in nutrition. In spite of losing daily more than a pound in weight from the loss of fluid by perspiration, the patient usually steadily gains in weight. Gains of from three to four pounds weekly have been quite common. As regards the effect on the affected joint it is various, depending on the amount of effusion and the degree of *anchylosis*.

Generally a considerable increase in the mobility follows after the use of a few baths.

It cannot be expected that restitution can take place in advanced cases, but before much actual destruction takes place, there is every reason to look for a decided check to the progressive character of the disease.

Dr. Shingleton Smith (Bristol) questioned whether the term rheumatism should ever be used in connection with the disease, and he preferred the term rheumatoid arthritis to that now advocated in Germany by Dr. B umler, chronic polyarticular rheumatism. He believed that the ordinary theories of the disease failed to give a satisfactory explanation of its phenomena, that it had no connection with tubercle, syphilis or nerve disease, and that probably it had little connection with ordinary acute and chronic rheumatism. One fact mentioned by Dr. Stewart, that 30 per cent. of the male cases had a history of gonorrhœa, gives us a clue to a more satisfactory view of the nature of the malady ; it has been abundantly shown that gonorrhœal rheumatism is due to infection from the urethra, and is a form of pyæmic infection due to the gonococcus. Is it not probable that rheumatoid arthritis is also due to some microbic infection, and that the coccus described by Drs. Bannantyne and Wohlman, of Bath, and cultivated by Dr. Blaxall, may be the real cause of the polyarthritis in its early stages, whereas the subsequent phenomena are only the sequelæ of the arthritis itself ? This theory gives us a more hopeful

view of the possibility of a more successful treatment before the incurable deformities and other sequelæ have occurred.

Dr. Lindsay (Belfast) would base his remarks on twelve or thirteen years of hospital practice in Belfast, where the disease was frequent. He had seen nothing to justify the theory of any special connection between rheumatoid arthritis and tuberculosis. He had been much struck with the nervous symptoms present in rheumatoid arthritis, especially the atrophy of muscles. He was inclined to suspect that these symptoms were due to changes in the peripheral nerves, possibly due to some toxic influence. He thought there was a real and frequent connection between rheumatoid arthritis and chronic articular rheumatism. He had seen many cases where the former had supervened upon the latter, and had seen other cases in which he found it quite impossible to draw the line between the two diseases. He thought the two conditions presented considerable analogy as regards their etiology. As regards treatment, he had not found much advantage from the ordinary anti-rheumatic remedies. He thought cod-liver oil and a general tonic line of treatment offered the greatest prospect of benefit.

Dr. A. Jacobi (New York), said : In his very concise and comprehensive paper Dr. Stewart had omitted one thing—namely, to tell us what he meant or we are to mean by arthritis deformans or rheumatoid arthritis. We have been told about boundary lines and gradual transitions, but I have been unable to learn his opinion of the pathological anatomy. One thing is certain : it is not acute articular rheumatism and not a sequela of it. The latter is an affection (anatomically speaking) of the synovial membranes, never of the cartilage. Arthritis deformans is an affection (again anatomically speaking) of the cartilage, which, while first exhibiting proliferation, terminates in atrophy and absolute loss, and finally in circular hypertrophy and eburnation round the atrophic cartilage. From gout it differs by the absence of uratic deposits. I cannot tell what arthritis deformans is : the presence of cocci in a few cases does not prove the latter to be the cause. It may be that in the future it will be best to study the cases of arthritis deformans in childhood, where it may be expected to be primary and uncomplicated. Two such cases in girls of 10 and of 6 years were published here in Montreal by Dr. Nicholls ; one was published by Dr. Koplik (girl of 7). In none was there acute rheumatism or any rheumatism previously. As far as the latter is concerned, we should not use the term except in acute rheumatism. The best treatment had been in his hands arsenic in increasing doses, continued months and months with occasional interruptions, and the galvanic current.

Dr. J. C. Wilson said: The use of the term rheumatism is a stumbling block in the way of our knowledge of diseases of the joints. It should be restricted to the disease known as acute rheumatism, or better, as rheumatic fever. Such a restriction would clear the way for a better understanding of the medical arthropathies. There are various forms of joint diseases, very different in their clinical manifestations, which must be regarded as arthritis deformans. Many cases in their early course progress by attacks resembling those of subacute rheumatic fever. These cases suggest a resemblance to that disease which is only superficial, but lend support to the view that the disease may be of microbic origin.

Dr. Frederick C. Shattuck (Boston) said: I rise with some diffidence, having unfortunately been prevented from hearing Dr. Stewart, but venture to touch briefly on several points. In the first place, I cordially concur in the opinion which seems to be generally held that our ignorance with regard to this disease is lamentable. Pathologically and therapeutically alike it is one of the opprobria of medicine. Since the appearance of the observations of Smith and Lindsay, Dr. J. E. Goldthwaite, of Boston, has been carefully studying the fluid obtained from joints affected with arthritic deformans where such could be had. Thus far he has not confirmed Smith and Lindsay's observations, having found no organisms of any kind. Some eight years ago my attention was forcibly arrested by an article in the *American Journal of Medical Sciences* by Blake. He relates several cases which seem to conclusively show that suppuration, especially if concealed, may have the most intimate relation with arthritic disease, non-rheumatic, similar to arthritis deformans in some respects. One of these cases was that of a clergyman of middle age who became the subject of severe, intractable, advancing arthritic disease. Blake found a nasty condition of things beneath a tooth plate, careful attention to which was followed by complete recovery. Since then I have carefully sought for concealed suppuration in all cases of chronic and obstinate arthritis which have come under my observation. I have failed to find such save in one case—one of advanced and severe arthritis deformans and psoriasis. In this patient I found a neglected Riggs's disease. The teeth were thoroughly treated by a competent dentist, and a very sharp acute exacerbation of the arthritis promptly followed. There would seem to be an analogy between Blake's cases and those of gonorrhœal synovitis. I trust that any gentleman whose attention may have been called to this point will speak of it.

Dr. Moorhouse said: I believe that there is an intimate relationship between arthritis deformans and ordinary rheumatism, but that

the disease has advanced a step farther in attacking the substance of the synovial membranes and cartilages. I am quite in accord with Dr. Lindsay (Belfast) both as to cause and treatment, believing that tonic treatment is the better plan, never having seen any benefit from the ordinary antirheumatic treatment, tonics such as iron, quinine, arsenic, cod liver oil, etc. I do not think that any microscopical germ has yet been discovered.

Dr. J. E. Graham (Toronto) said: The diagnosis between gout and chronic rheumatic arthritis has given me the greatest difficulty. This, I suppose, was not referred to by Dr. Stewart, because the differentiation between chronic rheumatism and arthritis deformans is quite sufficiently extensive for one discussion. I agree with Dr Jacobi that we should have a clear idea of the pathology of the disease; the hyperplasia and destruction of cartilage, and the eburnation of the ends of bones are marked characteristics which differentiate this disease from those affections of joints which are usually placed under the head of chronic rheumatism. It is unfortunate that the term "rheumatism" should be given to a number of joint affections arising from causes altogether distinct from those of acute and subacute rheumatism. I have found arsenic one of the most valuable remedies in the treatment of this very obstinate disease.

Dr. Gibney (New York) expressed his inability to contribute to the differential diagnosis between arthritis deformans and rheumatism, or even to the etiology and pathology. He failed to hear Dr. Stewart's paper, but learning that this paper included a discussion of the treatment by superheated dry air, believed that he might contribute his experience which was in general terms satisfactory. He had found the hot-air treatment specially valuable immediately after surgical means, such as breaking up adhesions or improving the position of the limb. He called attention to the importance of protecting the joint in examination by absolute immobilization, and of affording a limited amount of protection on the subsidence of the exacerbation, especially in the management of the knee, the ankle, and the elbow. This he does by an appliance limiting the range of motion to that allowed by Nature herself. He found valuable assistance in arsenic and cod-liver oil.

Dr. Tyson (Philadelphia) thought the subject thoroughly covered by what had been said. Personally he inclined to the view that in a certain number of cases the true rheumatic condition, or that generally conceded to be it, had at least a predisposing, and possibly through its specific cause a direct causal relation to rheumatoid arthritis. However this may be, he considered that an infectious nature must

be conceded in other cases, as attested by the large proportion (30 per cent.) in which there was previous presence of an infectious disease reported by Dr. Stewart. As to treatment, his experience, like that of others, had been most unsatisfactory ; no cures, but simply palliation, followed in most cases by relapse. His method of treatment has invariably been by general restorative measures, among which he included especially cod-liver oil, arsenic, the best of food, and hygiene. Massage, too, he thought was sometimes an efficient palliative.

The PRESIDENT (Dr. Stephen Mackenzie) commenced by paying a tribute of respect to Dr. Stewart for his very able handling of such a difficult subject as arthritis deformans. He indicated that in his experience arthritis deformans was a disease distinct from rheumatism, acute and chronic, and had nothing whatever to do with gout. He especially drew attention to the class in which the primary arthritic attack could not be distinguished from rheumatic fever, and recovery took place without any appreciable deformity of the joints, but which subsequently came under observation in an attack of ordinary and undoubted subacute or chronic arthritis deformans. The late Dr. H. G. Sutton drew attention to the association of osteo-arthritis, rheumatism, and insanity in families. He also pointed out that though in a considerable proportion of cases of arthritis deformans there was a history of rheumatic fever, yet in not 1 per cent. of cases of arthritis was heart disease found on *post-mortem* examination. He quite agreed with some previous speakers, especially Dr. J. C. Wilson, that under the term arthritis deformans there was probably a number of groups of cases which would ultimately be separated as clinical entities.

A DISCUSSION ON CHOLELITHIASIS: CAUSATION, SYMPTOMS, DIAGNOSIS, AND TREATMENT.

I.—William Hunter, M.D., F.R.C.P.

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On Causation and Treatment of Cholelithiasis.

The subject of cholelithiasis, which it is my privilege to bring before this Section, is one well fitted for discussion, a common disease affecting no fewer than 7 to 10 per cent. of cases, and yet in its mode of origin still exceedingly obscure, running a very varying clinical course, sometimes without symptoms, at other times the cause of the most intense suffering, presenting in its course problems in diagnosis and treatment baffling at times physician and surgeon alike. No portion of the subject presents greater difficulties than that of causation. And it is with this portion I propose especially to deal.

What are the conditions, general or local, that determine the formation of biliary concretions within the bile passages? At the outset I would remark how slowly our knowledge of this subject has advanced; how limited it still is; how little, except in one or two particulars, presently to be noted, it differs from that possessed 50 or 150 years ago.

Stagnation and inspissation of bile contributed to by advancing age, sedentery habits, inactive life, slowing of circulation, interference with movements of chest and abdomen by such causes as lacing and pregnancy, consequent greater liability of women to suffer than men (five times greater)—all these were recognized and pointed out so long ago as 1757 by Thomas Coe.[1] In great part they represent the amount of the knowledge we have till recently possessed. Yet the inadequacy of these various factors to account for the formation of gall stones was then, as now, fully recognised, the presence of gall stones in the young and active, their absence in the old and inactive.

Did this represent all the knowledge we at present possess regarding the causation of cholelithiasis I confess I should have little satisfaction in discharging my present task. Fortunately it does not, thanks to observations of the last few years which have introduced to our notice a new class of facts. Up to the present these observations are chiefly interesting from their extreme suggestiveness rather than from their conclusiveness. They are only conclusive in one direction,

[1] Brookbank, On Gall Stones, London, 1896.

namely, in pointing to local conditions within the bile passages and gall bladder as the immediate cause of gall stone formation.

The general result is to show that in cholelithiasis we have to do with a local disease affecting the bile passages or gall bladder, or both, and not with any general constitutional disturbance affecting nutrition or metabolism.

The result of the observations to which I refer has thus been to confirm in the amplest way the view held by Budd (1857). The relation of events in the formation of gall stones Budd held to be, diseased condition of mucous membrane, increase of cholesterin in solid form, deposit of this around any small particle of inspissated bile that may be present. A similar view was held by Bristowe. But the observer, to whom more than any other we are indebted for establishing this on a basis of facts, is Professor Naunyn of Strassburg, whose elaborate and valuable monograph on *Cholelithiasis*, published in 1892, gives the fullest and clearest account of the subject we possess.

Physiological Considerations.

Before passing to consider what these local conditions are, let me preface with a few remarks as to the bile itself and the conditions which in health determine its quantity, quality, and secretion.

We have to do with a watery secretion of low specific gravity, excreted in quantity of about two to three pints daily, containing some 1 to 2 per cent. of solids; these consisting of certain specific constituents—the bile pigments and bile acids—formed by the liver cell itself; certain inorganic salts, the most important of which in the present relation is calcium; a constant percentage of the insoluble body, cholesterin, held in solution by the salts of the bile acids and by the traces of fats and fatty acids present; and, lastly, a considerable amount of mucoid material formerly regarded as mucin, now shown to be of more complex character—a mucoid nucleo-albumin—which is added to the bile during its passage along the bile passages, and especially during its sojourn in the gall bladder.

This fluid is secreted constantly, more abundantly four or five hours after food under the direct stimulus of the food products conveyed to the liver during digestion, less actively and more concentrated during the night when digestion is in abeyance. During active digestion and secretion it flows into the duodenum, expelled in a series of jerks by peristaltic action of the muscular fibres in the walls of the larger bile ducts. In the intervals between digestion its passage is temporarily arrested by the sphincter-like contraction of the wall of the duodenum through which the common bile duct obliquely passes, and

it then collects in the gall bladder, where it lies till the next period of active digestion to be again expelled, partly by the peristaltic movements of the intestines pressing upon it, but probably in great part by peristaltic movements in its own walls.

The pressure at which the bile is secreted is very low, so that the rapidity with which it flows is greatly influenced by outside influences, notably two :—1. The amount of resistance it meets with in the long line of narrow bile passages through which it passes. So that an increase of mucus hardly appreciable in itself may nevertheless considerably retard the flow of bile. 2. The freedom of movement of the diaphragm. Free movement of the diaphragm by compressing the liver is probably one of the most important factors in promoting expulsion of bile from the bile passages and from the gall bladder, and any cause which interferes with such movement, for example, tight lacing, pregnancy, sluggish habits of life, will correspondingly tend to retard proper expulsion of bile from the gall bladder.

General Etiology.

Age.—The most recent information is that given by Schröeder of Strassburg, 1,150 cases examined, of which 141 (12.25 per cent.) showed gall stones, and Brockbank of Manchester, 742 cases, 49 of which (6.6 per cent.) showed gall stones.

Table Showing Influence of Age.

Age.	Schröeder.	Brockbank.
0—20	2.4	2.9
21—30	3.2	5.3
31—40	11.5	3.3
41—50	11.1	7.4
51—60	9.9	9.3
61 and over	25.2	13.6

The increase with advancing years, especially after the age of 60 is well seen in both tables, especially those of Schröeder (over 25 per cent. of cases).

The relatively larger percentage of cases (over 8 per cent.) observed by Brockbank below the age of 30 is probably connected with the fact noted by him that all his cases below 30 were the subject of heart disease ; in which condition there seems to be a special tendency to the formation of gall stones.

Sex.—The female sex is about five times more subject than the male. for example, 4.4 per cent, in men, 20.6 per cent. in women (Schroeder),

Pregnancy.—Out of 115 women in whom gall stones were found, no fewer than 90 per cent. had borne children (Schröeder).

Tight-lacing.—The same observer found gall stones in more than one-half of women whose livers showed any evidence of tight-lacing transverse furrows.

Laxity of Abdominal Walls—By allowing the liver to fall down, so that the fundus of the gall bladder is considerably below the level of the junction of the cystic duct with the hepatic duct, favours the retention of bile in the gall-bladder.

Diminished Movements of Diaphragm.—The expulsion of bile is at all times greatly influenced by movements of the diaphragm, and any restriction in the range of its movements correspondingly favours its retention. This is probably the way in which pregnancy operates in favouring the production of gall stones; as also tight-lacing, and sedentary habits.

Sedentary Habits.—It is this factor which probably induces the liability to gall stones seen with advancing age, also seen in inmates of lunatic asylums.

Heredity is regarded as a factor by some; on insufficient evidence, however, I consider. Out of 165 cases, Bouchard found a parental history of gall stones in 36.

Gout is also regarded as favouring cholelithiasis. In 95, out of 166 cases Senac found a history of hereditary or acquired gout (1895). On the other hand Bouchard only found it in 13 out of 165 cases.

Influence of Food.—Habits of life as regards character of food and water have been regarded as factors in producing gall stones; also as serving to explain the greater frequency of cholelithiasis in different countries and in different parts of the same country. On this point no definite data are, I consider, forthcoming. We are dealing with impressions rather than with facts. As a matter of fact cholelithiasis occurs in every rank and class of society; in the poor and sparely nourished as much as in the obese and over-fed.

Influence of Disease.

Insanity.—Inmates of asylums are prone to gall stones; doubtless in consequence of the sluggish, apathetic habit so characteristic of many forms of insanity.

Heart Disease seems to favour occurrence of gall stones. Out of 49 cases, no fewer than 27 were found to suffer from cardiac lesions (Brockbank).

Chronic Rheumatism.—29 out of 165 cases.

Diabetes.—16 out of 165 cases observed by Bouchard.

Renal Lithiasis.—A relation has been said to exist between the occurrence of gall stones and renal calculi. Thus Kraus found the two associated in 42 cases. On the other hand the statistics of others lend no support to this view. Thus Naumyn has only observed the association once.

Conclusion.

General etiology thus throws but little light on the causes underlying the disease. It only brings out one fact—that anything which favours stagnation of bile in the gall bladder favours the occurrence of cholelithiasis.

Special Etiology.

Biliary Concretion.—In cholelithiasis we have to do with a precipitation of certain of the biliary constituents in insoluble form. (1) Cholesterin; normally held in solution in normal bile by the bile salts and the traces of fats and fatty acids present in the bile. (2) Bile pigment; normally in solution, now thrown down as an insoluble compound in combination with another normal constituent of the bile, calcium.

The problem of the causation of cholelithiasis thus narrows itself to the question—What are the conditions, general or local, that determine the formation and precipitation of these normal biliary constituents in the same mass, and in the form they are met with in gall stones?

Characters of Gall Stones.

On the characters of these gall stones I need not dwell; their variation in shape, number, and size; their peculiarities in shape from pressure against each other; their amorphous or crystalline character.

They have been variously classified according as one or other constituent—cholesterin, bilirubin calcium, carbonate of lime—predominates; according to the relation of the constituents to each other, the cholesterin surrounding a nucleus of bilirubin calcium, or itself forming a nucleus, or both intermixed; or, according to the crystaline or amorphous character of the cholesterin present.

The following classification of Naumyn will illustrate the various forms met with:

Varieties of Gall Stones.

1. *Pure Cholesterin.*—Oval or round, rarely facetted, crystalline, consisting of almost pure cholesterin.

2. *Laminated Cholesterin,* resembling the foregoing in form and size, but more often facetted, on section more or less distinctly lami-

nated ; outer layers amorphous, becoming more and more crystalline towards the centre, consisting chiefly (90 per cent. or more) of cholesterin with a constant trace of bilirubin calcium and calcium carbonate.

3. *Common Gall Stones* from gall bladder, comprising the great bulk of gall stones of the most varying size, shape, and colour, usually facetted with a central nucleus of bilirubin calcium, surrounded by amorphous cholesterin and bilirubin calcium in varying proportions.

4. *Mixed Bilirubin Calcium.*—Size of a cherry or larger, met with singly or at most two or three in number, in gall bladder or larger bile ducts, dark in colour, the great mass formed of layers of a dark or rusty brown colour, made up in great part (75 per cent. or more) of bilirubin calcium, the remainder cholesterin.

5. *Pure Bilirubin Calcium.*—Small, black, irregular, size of a pea, non-facetted, found in gall bladder, but frequently also in intrahepatic bile ducts, consisting almost entirely of bilirubin calcium with a constant trace of humin substances.

6. *Rarer Forms.*—(*a*) Amorphous and imperfectly crystalline stones of cholesterin, often of pearl-like color, seldom laminated, with a central nucleus of bilirubin calcium ; with this exception consisting of pure cholesterin.

(*b*) Chalk stones, composed of calcium carbonate recognizable by their extreme hardness.

(*c*) Conglomerate stones, the body consisting of mixed bilirubin calcium stone, the nucleus of pure cholesterin, in many cases two or more nuclei surrounded by a common body ; or the nucleus formed by a foreign body—for example, a needle, plum stone, piece of round worm, of a distoma, or cast of intrahepatic bile duct.

(*d*) Stones having the shape of the larger bile ducts, consisting of bilirubin calcium, not seldom in cattle, very rare in man.

From the point of view of causation, I prefer a classification simpler. From that point of view, it appears to me to be of relatively little importance in what proportions the constituents are present, or in what form, crystalline or amorphous, or the degree and character of the lamination or classification.

What impresses me is—

1. In the vast proportion of gall stones the two chief constituents are cholesterin and bilirubin calcium.

2. While in exceptional cases cholesterin may form the nucleus of the stone, in the vast majority the nucleus is made up of bilirubin calcium. This latter must therefore have been the earlier formed, and around this the cholesterin is deposited pure, or intermixed with more bilirubin calcium, as the case may be.

3. Almost equal in frequency to this mixed gall stone is the biliary concretion formed of bilirubin calcium alone, without any cholesterin; the small dark brittle concretions one so frequently finds, not only in the gall bladder, but also not infrequently within the intrahepatic bile ducts themselves. These characters I can demonstrate to you in the lantern slides I now show.

These two facts—the frequency of concretions of pure bilirubin calcium without any cholesterin, and of nuclei formed of this material, denote that the conditions underlying the formation of gall stones are, in the large majority of cases, primarily such as favour the precipitation of bilirubin with calcium.

Seat of Formation of Gall Stones.

In this connection there appear to me to be three outstanding facts:

1. Within the intrahepatic bile ducts the concretions have nearly always the character of pure bilirubin calcium. The conditions, whatever they may be, which lead to the precipitations of bile pigment and calcium in insoluble form, must thus occasionally exist high up within the liver, and be entirely independent of anything prevailing in the gall bladder, or common bile duct. We can conceive of such small concretions, for they are all of small size, being carried down with the bile into the hepatic duct, and thence into the gall bladder (and this is probably the source in many cases when present in the gall bladder); but we cannot conceive the reverse, such concretions having been formed low-down and carried up in the absence of obstruction into the liver against the direction of the bile flow.

2. In the common bile duct and hepatic duct the stones usually met with have a special character of their own—such as I now show you. They are usually large, round, or oval, dark in colour, and either single or at most in groups of two or three. They are found in cases of obstruction of the common duct, in which the duct becomes widely dilated, its walls thickened and inflamed. On section the bilirubin calcium element is found to predominate It forms the nucleus and the greater mass of the stone, only a small proportion of cholesterin surrounding the central mass. The original source of this kind of gall stone is doubtless in most cases the gall bladder, a smaller stone derived from the gall bladder having become impacted on its way down. But there can be hardly any doubt that the large size which such stones attain to is due to further formation and deposition of its constituents within the walls of the inflamed common duct. And it is interesting to note that just as in the case of the concretions formed higher up within the intrahepatic ducts, the bilirubin calcium element

is here the prevailing constituent. Cholesterin is in relatively small quantity.

3. It is, however, the gall bladder that is the chief seat of formation of gall stones, and it is in this situation a sort of *cul-de-sac* or back eddy where the bile can lie for varying periods of time undisturbed that the chief conditions are to be sought favouring the formation of gall stones. The stones here formed have in general this distinction; that, differing from the two classes just considered, the chief constitent is cholesterin, albeit that, as I have already pointed out, in the vast majority of cases there is a darker central nucleus of bilirubin calcium.

Source of the Constituents of Gall Stones.

We are now in a position to approach more closely the problem which cholelithiasis presents us, namely, what is the source and mode of origin of the cholesterin and bilirubin calcium which make up the great bulk of gall stones? And, first, with regard to cholesterin. Is it formed *in situ*, the product of a diseased mucous membrane of the gall bladder or bile passages, or is it precipitated from the bile by deficiency of its chief solvent agent, the bile salts, or, lastly, is it due to an increased excretion by the liver?

The evidence on this point although not conclusive is, I think, all in one direction, namely, in favour of it being entirely of local origin—a product of secretion or disintegration of the epithelium of the mucous membrane and glands of gall bladder, and of the larger bile ducts. It is a product widely distributed throughout the body. It occurs not only in bile, but also in nervous tissues, blood corpuscles, spleen, seminal fluid, testes, ovary, yolk of egg. Hence it has been thought that its presence in the bile is solely due to its excretion by the liver from the blood. There is, however, no actual evidence, in my own opinion, that such is the case.

On the other hand, there is conclusive evidence that it is a frequent product of degenerative conditions, being found in atheromatous, cancerous, and tuberculous products; in ovarian and less frequently in ascitic and pleuritic fluids; in pus; in thyroid cysts, and more especially in the secretions of mucous membranes, for example, sputum of bronchitis, phthisis, etc. This latter fact appears to me to be one of great significance in relation to our present subject—strongly suggesting that if it can be formed in quantity by mucous membranes elsewhere, it probably has a similar origin in cholelithiasis. In bile it is present in the small proportion of about 0.7 per 1,000; in the bile from gall bladder in much higher amount, 3½-11 per 1,000.

In the sputum of catarrhal bronchitis it has been found in propor-

tion of 0.9 per 1,000 ; in sputum of bronchiectasis in even higher proportion—1.5 per 1,000 (Naunyn)—2.2 and 2 per cent. of the solid constituents respectively. Cholesterin then appears to be pre-eminently a product of cellular degeneration, especially of epithelium degeneration. And such appears to be its source in the bile. The evidence appears to me to point to its local origin in the bile passages, both in health and disease.

Naunyn indeed has been able to trace the origin of this product from the degenerating epithelium. It is formed as viscous myelin globules within the degenerating epithelial cell. It escapes in this viscous condition and can be seen floating about, and on the addition of a few drops of acetic acid it can be seen solidifying into a mass of cholesterin crystals. Conversely, similar myelin masses can be produced by the action of a solution of soap on cholesterin as described by Brockbank. The formation of viscous masses by the mucous membrane of gall bladder, consisting almost solely of pure cholesterin, I have also been able to observe ; these viscous masses on pressure against one another and adjacent gall stones already assuming the characteristic shape of gall stones. The important conclusion is thus led up to, that the cholesterin which goes to form gall stones has never really been in solution in the bile, but has been in a more or less solid viscous form from the beginning, formed as a product of degeneration of the epithelium of bile passages.

With regard to the insoluble compound, bilirubin calcium. In normal bile these two constituents are not combined. Nor can they be made to combine by any mere concentration of bile. Bilirubin itself may deposit under such circumstances, but not in combination with calcium. Nor can the two be made to combine by any mere excess of lime, at least in the first instance. But if further excess be added a deposit of bilirubin calcium finally takes place, till finally the whole of the bilirubin is thus precipitated. There appear then to be substances in the bile which prevent the precipitation of bilirubin calcium even when the amount of lime is considerably increased (Naunyn). The bile salts seem to exercise some such function. Thus it only requires the addition of a few drops of limewater to a weak ammonical solution of bilirubin to precipitate the whole of the latter as bilirubin calcium (Naunyn). But if such a solution contains $2\frac{1}{2}$ per cent. of glycocholate of soda, precipitation only begins when five times the quantity of limewater is added. The lime is seized upon by the bile acid. It is probable then that a certain reaction of bile is necessary for the formation of this bilirubin calcium compound.

Apart from mere reaction, or proportion of bile salts present, there

is another observation of interest in this relation, namely, that just as egg albumen favours the precipitation of calcium carbonate from solutions of bile salts, so also egg albumen favours the precipitation of bilirubin calcium (Naunyn). This suggests, then, that the presence of albumen in the bile passages and gall bladder may favour the formation of bilirubin calcium concretions. Albumen derived from the disintegration of epithelium, that is, catarrh, which promotes such disintegration, is thus in all probability the factor which determines the precipitation of bilirubin calcium within the bile passages and gall bladder.

Catarrh of Gall Bladder and Bile Ducts as the Immediate Cause of Cholelithiasis.

It thus appears that the conditions leading to increased formation and deposition of cholesterin in solid form, and to the precipitation of the insoluble body—bilirubin calcium—are essentially local, and are of the kind—increased epithelial degeneration and presence of albumen—that prevail in a special degree in catarrhal and inflammatory conditions of the lining membrane of gall the bladder and bile ducts. I have now to consider what it is that sets up this catarrh.

Among the various factors which have been held responsible for the formation of gall stones—the influence of age, sex, heredity, gout, rheumatism, etc., the only one whose influence is undoubted is stagnation of bile. In the list of conditions I have noted under "general etiology" it will be seen that the degree to which any one of them favours the incidence of cholelithiasis may safely be regarded, as in direct proportion to their liability to favour stagnation of bile in the gall bladder. Hence the greater frequency of the condition in advancing age, in women, especially in pregnant women; in those of inactive habits of body from gout, rheumatism, etc.

Frerichs taught that stagnation of bile alone might of itself in time excite a catarrhal condition of the mucous membrane by favouring decomposition of the bile itself. With the knowledge we now possess this view cannot be accepted. It may, I think, be taken as certain that such a decomposition does not occur in the absence of micro-organisms. Stagnant bile, if kept sterile, does not deposit bilirubin calcium, or cholesterin. Normal bile is aseptic, as shown by Netter, for rabbits (1884); by Naunyn, for dogs and rabbits. Human bile is also sterile. Gilbert and Girode found it so in 6 out of 8 cases even as long as twenty-four hours after death; Naunyn in 2 cases examined one, and five hours after death, and in 2 cases punctured during life; and myself in 2 cases examined fourteen hours after death. In

a third case examined by me twenty-two hours after death, *post-mortem* infection had already occurred, the bile contained a gelatine liquifying organism. As causes of catarrh there are, I consider, two possible factors to be considered.

Infection as a Cause of Catarrh.—As one of the commonest causes of catarrh of inflammatory conditions of gall bladder and bile ducts, we have now to recognise infection of the bile and bile passages with organisms; and in favouring such infection no single factor is more important than stagnation of bile. This is very well brought out by certain experiments made by Naunyn. In five cases of gall stones he obtained the bacillus coli communis by puncture of the gall bladder during life. The injection of this organism into the gall bladder of the dog excited no trouble; but if the common bile duct were previously ligatured so as to bring about a stagnation of bile, then the injection set up the most violent inflammation (cholecystitis and cholangitis).

The organisms which have been found as causes of inflammation of the gall bladder in individual cases include the pyogenic organisms—staphylococcus and streptococcus—the common bacillus of the intestine, B. coli communis, and the typhoid bacillus.

The observations in this relation are so far but few. But they are likely to be rapidly added to now that attention has been drawn to the subject, and especially now that opportunities are afforded by the surgeon for more frequent examination of the gall bladder. For the present chief interest attaches to B. coli communis and the B. typhosus. The former is the organism that has been found in the majority of cases of cholecystitis and cholangitis. The connection between the latter organism and inflammatory conditions of gall bladder is of peculiar interest. Dufort (1893) has described a case of cholecystitis and gall stone following at a few months' interval an attack of typhoid fever, and he found the typhoid bacillus in the gall bladder. Up to 1876, 18 such cases were collected by Hagenmüller from the literature. In a recent case I found a marked inflammatory condition of the whole mucous membrane of the gall bladder in a case of typhoid fever. On microscopic examination the mucous membrane showed thickening and small-celled infiltration.

The question as to the connection between such an infection and cholelithiasis is of still more interest. In a certain number of cases the first attack of gall stones has followed at an interval of two or three months an attack of enteric fever, as in Dufort's case above noted. A similar case has been described by Gilbert and Girode (1893). In no fewer than 19 out of 22 cases of enteric fever the presence of

the typhoid organism has been demonstrated in the contents of the gall bladder by Chiari (1893); in 15 of these cases in pure culture In all these cases the common bile duct and cystic duct suggest themselves as the channel of infection that the organism has of finding its way upward from the duodenum. This would be in accordance with Sherrington's results. Sherrington has shown for a large number of organisms investigated by him that it is the exception for them to pass into the bile after their injection into the general circulation So that this source of infection may, in general, be excluded. And yet certain interesting observations made by Professor Welch, of Baltimore, and published in the *Bulletin* of the Johns Hopkins Hospital in 1891, would indicate not only that infection of the gall bladder with the typhoid organism may occur from the blood, but that this infection may persist there after it has disappeared from every other organ of the body. He found the typhoid bacillus in the gall bladder of rabbits as long as three or four months after its intravenous injection, at a time when it could not be found in any other organ of the body, even in the spleen and intestine. Such, briefly, are the chief facts. Here I must caution against any too hasty generalisation from them as to the frequency of the connection between cholelithiasis and typhoid fever. That remains a problem still to be worked out.

At the present time the facts are, I think, chiefly interesting from their suggestiveness. In whatever way the infection occurs, whether through the bile passages, as is probably the most common, or through the blood, the important fact I wish to bring out is that infection of the bile and gall bladder with organisms is of no infrequent occurrence; that under favourable circumstances, the chief of which is stagnation of bile, such infection can set up catarrhal and subacute inflammatory conditions of the lining membrane of gall bladder and bile ducts, in certain cases even intense suppurative conditions.

In the etiology of gall stones, where, as I have shown, catarrhal inflammation plays such an important part, infection thus comes to rank as a possible and most important factor. I do not speak here of the part it plays in producing the symptoms of acute attacks—the fever, the swelling, and tenderness over the gall bladder, possibly the ague-like attacks—from which the subjects of gall stones suffer, or the suppurative conditions of gall bladder and bile ducts met with in severer cases. I am only concerned with the earlier and gentler *rôle* played by infection as a catarrh-producing factor, setting up a catarrhal inflammation sufficient to lead to a largely increased formation of cholesterin and to the precipitation of bilirubin calcium.

A temporary infection of this kind, whether the organism be the

colon bacillus, or the bacillus of typhoid fever, or other organism extending over a few months, may, without causing any symptoms, excite a catarrhal inflammation of the gall bladder, sufficient to produce a crop of gall stones, and then pass off completely, leaving the latter as a permanent heritage to the patient. It is probably in this way that gall stones usually arise and why they are met in such numbers. If the infection passes off the stones may remain quiescent for years without causing any symptoms, probably undergoing but little increase in size. But even so they are always liable to excite trouble. Their mere presence may serve mechanically to keep a certain moderate degree of congestion of the mucous membrane of the gall bladder. But a more important danger is that a subsequent infection may occur and induce a cholangitis or a cholecystitis, or one of the stones may pass down and become impacted.

Excretion through the Liver as a Cause of Catarrh.—So far the only factor I have spoken of as a possible catarrh-producing agent has been infection. And in speaking of it, I have had specially in mind the gall bladder as the chief seat of formation of gall stones. In general it may be stated that what applies to the gall bladder in this relation applies also to the cystic and common bile ducts. Stones found in the latter situation have originally come from the gall bladder, although they attain the large size so commonly met with in stones in this situation by subsequent increase. I have, however, now to refer to another class of stone, the seat of whose formation is not necessarily the gall bladder or the common bile duct, but higher up within the intrahepatic ducts. In speaking of the possible seats of formation of gall stones, I pointed out that small dark calculi consisting of bilirubin calcium are not infrequently met with high up within the liver, lying within the smaller intrahepatic ducts. The presence of these calculi in this situation appears to me to be of particular interest. They consist usually of bilirubin calcium—an insoluble body for whose formation a catarrh of the bile passages is as important as for that of cholesterin itself.

How is this intrahepatic catarrh set up ? Infection may, I consider, be set aside. It is highly improbable that an infection may travel up along the bile duct and excite catarrh in the higher intrahepatic ducts without affecting the lower. The more probable cause of such intrahepatic catarrh appears to me to be one, pointed to by certain observations of my own, namely, the excretion of products through the bile, exerting an irritant action on the bile passages.

That the bile has an excretory function for substances injected into the blood or administered by the mouth or intestine has been shown

for quite a number of drugs and medicinal substances, for example, ferrocyanide of potassium (Claude Bernard); iodide of potassium, cane and grape sugar, sulphate of copper, oil of turpentine (Mosler); iodide of potassium, bromide of potassium, iron, lead, nickel, arsenic, silver, bismuth, and antimony (Wichert); iodide of potassium, salicycate of soda, carbolic acid (Peiper); oil of turpentine, salicylic acid (also after administration of salol) bromide of potassium, iodide of potassium, chlorate of potash, arsenic, iron, lead, mercury (Prevost and Binet).

The excretion through the bile may begin very early; for example, salicylate of soda being detected in the course of half an hour after administration, iodide of potassium after some six to eight hours (Peiper).

In the case of the above substances there is no evidence that in the course of their excretion they exert any injurious action. On the contrary, the action of some of them is beneficial, causing an increased secretion and flow of bile.

Very different is the result with another class of substances, of which toluylenediamine may be taken as a type. This body has the power of producing intense jaundice in dogs, the jaundice being obstructive and caused by intense concentration and viscidity of the bile.

When the jaundice is at its height, the smaller bile ducts are found plugged with thick viscid bile, while lower down in the common duct only thick viscid colourless mucus is found.

The particular observation of my own I have referred to is that the change in the character and viscidity of bile is due to inflammatory catarrh of the whole system of bile ducts extending from above downwards, set up by the excretion of the poison itself (or derivatives of it) through the bile. I found the drug in the bile as early as half an hour after its injection into the blood. In large doses it exerted an intense irritant action, not only on the bile passages, but also on the duodenum in cases.

From the opening of the bile duct downward the most intense inflammatory condition was produced, the mucous membrane, as determined by actual measurement being swollen to $3\frac{1}{2}$ times its normal thickness, reddened and inflamed, and covered with tenacious colourless, inflammatory mucus, and similar mucus was seen exuding from the opening of the common bile duct.

This duodenal condition, I would ask you to note, is secondary to the intrahepatic catarrh. The latter is produced even when the common bile duct is ligatured, and the bile is allowed to flow out through a fistula.

It is thus no question of a catarrh of bile ducts secondary to a duodenal catarrh. The relation is the other way: the catarrh has spread down the bile ducts from their origin.

The significance of these observations in relation to the pathology of jaundice caused by poisons, and in relation to catarrh of the intrahepatic bile ducts, I have discussed in full elsewhere.[2] They establish to my mind the great importance of this excretory function of the liver in relation to intrahepatic catarrh. The liver is constantly being called on to deal with products more or less harmful carried to it in the portal blood from the intestines. It deals with them in two ways, either by destroying them, or by excreting them—most usually by both.

If these products possess any irritant qualities, this continuous excretion will tend to set up and maintain a certain degree of intrahepatic catarrh in direct proportion to any irritant qualities they possess.

And this is precisely the state of things favoured in the chronic dyspeptic, in those who lead a sedentary life, in the "bilious" subject generally.

I consider it possible, then, that under the conditions just referred to, a state of intrahepatic catarrh of excretory origin may be induced, and that in certain cases this may suffice to lead to the precipitation of the bile pigment and lime of the bile in the form of the insoluble bilirubin calcium compound.

In this way small biliary concretions may, I think, be produced independent altogether of infection. It is conceivable even that in certain cases, such intrahepatic concretions, carried downwards and lodging in the gall bladder, may form the starting-point of a moderate and non-effective stone formation in the gall bladder itself.

Such, I conceive, may well be the mode of origin of the gall stones so often met with in the gall bladder of old people, that have never caused any symptoms. Such also I consider to be the nature of the cholelithiasis met with in the subjects of heart disease. Here the catarrh of bile passages and gall bladder is set up and maintained by the passive congestion prevailing in the liver generally. In a recent case of this kind I found the mucous membrane of gall bladder chronically congested and thickened, producing thick viscous clumps of material which lay between the individual stones, many of the clumps already showing the shape of stones. On the addition of a few drops of acetic acid they threw down cholesterin crystals in abundance. I regard them as gall stones in their earliest stages.

[2] Allbutt's System of Medicine, Vol. 4.

II.—J. E. Graham, M.D., Toronto.

The Symptoms and Diagnosis of Cholelithiasis.

The success of surgical interference in gall stone disease renders it incumbent upon the practising physician to make an early diagnosis, so that calculi may be removed before serious damage is done by their presence either in the gall bladder or in the large bile ducts, and before the system is irreparably injured by poisons circulating in the blood, the result of obstructive jaundice, or of the absorption of toxins produced, and by microbes.

Cases of gall stone disease are often divided into two classes, those without and those with jaundice. Although this classification has been of great use clinically it is at best an artificial one, since bile pigment may be found in the urine when the calculi are situated in any part of the gall bladder or bile ducts, although its presence is of course much more marked when they are arrested in the hepatic or common bile ducts.

It is impossible in the time allotted to me to give all the symptoms of biliary calculi. My intention is to describe briefly the course of the disease and to dwell more particularly upon symptoms which are of diagnostic importance as well as those which have been of special interest to me in practice. The symptoms of cholelithiasis are influenced to a greater degree perhaps than we suppose by the length of time required for the formation of the calculi. It is generally thought that they grow very slowly, but Naunym is of the opinion that ordinary gall stones of the soft variety may form in a few days, even in a few hours. Biliary concretions may exist in the gall bladder a number of years without producing any symptoms, at least any sufficient to lead the patient to consult a physician.

The frequent discovery of gall stones in *post-mortem* examinations of patients in whom they had not been suspected is a proof of this. They have been found in one-tenth of all cases and in one-fourth of all elderly women.

A number of indefinite symptoms have, however, been noticed, for instance, frequent bilious headache, bilious attacks without headache, and a feeling of pressure over the stomach after certain articles of food. I am strongly of opinion that if a frequent and careful examination of the urine was made bile pigment would be found in a number of these cases, especially when catarrhal cholecystitis is present. This latter condition in the chronic form may end in contraction and atrophy of the gall bladder. Courvoisier has collected sixty-three such cases, in seven of which the biliary passages were not in any way obstructed.

I had for a number of years a patient under observation who had xanthomata of the eye-lids and who suffered from frequent attacks of biliousness but with no local sign. She died of intestinal hæmorrhage and the gall-bladder was found filled with calculi. Fremitus has occasionally been noticed, and the stones have been detected by sounding. This is not a safe procedure especially if cholecystitis is present. When in addition to the presence of calculi there is an invasion of pyogenic organisms a series of symptoms of very grave character rapidly supervene. Pain and tenderness over the region of the bladder often set in suddenly. The pain is not of the nature of colic unless the cystic duct has been entered. Symptoms of localised peritonitis and irregular night temperature together with marked disturbance of the digestive functions, anorexia, nausea and vomiting are present.

I saw a very interesting case of this kind some years ago. The patient, a man of full habit, was in ordinary health, when while walking on the street he felt a pain in the right hypochondrium, which was accompanied by much tenderness in the hepatic region and by tension of the right rectus muscle. Symptoms of a remitting fever following with irregular exacerbations sometimes amounting to rigor. Death took place about six weeks after the commencement of the attack. At the *post-mortem* examination the gall bladder was found filled with calculi and the whole mucous surface was separated by ulceration. Pyæmic abscesses existed in the liver and kidneys. In some cases of suppurative cholecystitis the infective agent is the typhoid bacillus, and death may result from rupture and infective peritonitis. Several cases of the kind have been reported. Dr. Anderson, of Toronto, has described one in which at the *post-mortem* examination suppurative cholecystitis and typhoid lesions of the bowels were found. The amount of ectasia of the gall bladder varies in different cases. When there is an occlusion of the cystic duct from thickening of the lining membrane the distension may be very great. Biliary calculi may find their way out of the gall bladder either through the cystic into the common bile duct or through the walls of the viscus into surrounding connective tissue into the liver or into the peritoneal cavity.

Cases have been reported in which during a paroxsym the gall stones have been driven through the thin and tense wall of the gall bladder into the peritoneal cavity. Death from hæmorrhage followed in one case, and in another the bile flowed into the abdominal cavity and was removed by successive tappings. The aseptic bile did not produce any inflammatory action and the patient recovered. In such cases it is difficult to understand how a sufficient amount of force is

generated thus to expel a gall stone. The force is generally supposed to be produced by spasmodic contraction of the muscular fibres of the gall bladder and of the muscles of the abdominal walls. When the cystic duct is obstructed it is probable that the accumulation of fluid acts also as an expelling power. In the great majority of cases of rupture there has been a previous ulceration of the gall bladder wall and the calculi find their way into surrounding connective tissue.

When the gall bladder contains a number of calculi, diverticula are frequently formed. These are really herniæ in which the serous membrane alone remains. If suppuration takes place under these circumstances, abscesses are formed containing gall stones, and having direct communication with the cavity. Hour glass contraction of the gall bladder existed in 15 cases collected by Courvoisier. Cicatrices of the wall of the gall bladder have been found by Schloth in 14 out of 343 gall stone cases. With the exception just mentioned, calculi do not give rise to any special symptoms until they pass into the cystic duct when the well known symptoms of biliary colic supervene. Biliary colic occurs in less than half of all gall stone cases. An attack may be brought on by error in diet, emotional disturbance, or by active movements of the body. They occur during menstruation, during or after confinement, and after the removal of abdominal tumours. They also supervene after marked intestinal irritation in typhoid and other fevers.

Hayem has collected 18 cases occurring during the course of typhoid fever. The seat of the pain which is usually in the gall bladder region may also exist in the epigastrium, the left hypochondrium, or in the right shoulder. It is sometimes referred to the right inguinal region, and in one case I have mistaken gall stone for appendicitis. An elongated appendix may extend upwards towards the liver. The severity of the pain does not depend so much upon the size of the stone as upon its shape. The angular projections produce greater irritation to the sensitive mucous membrane, and cause more severe pain.

The ordinary symptoms of biliary colic need not be mentioned as they are all so familiar to us. I would like to refer to some of the less frequent phenomena. Death has occurred during an attack. Two or three cases have been reported by French authors in which symptoms of shock were shortly followed by death. Potain is of opinion that acute dilatation of the right ventricle may take place as evidenced by *bruit de galop*, and by pulsation in the epigastrium. This he thinks is due to a spasmodic contraction of the pulmonary capillaries, and consequent obstruction of the circulation. Convul-

sions have supervened in neurotic subjects. A case of paraplegia has been reported by Trousseau, and another by St. Cyr. Hepatic cough has been mentioned by the older writers, and functional troubles of the heart, as palpitation and irregular action, have also been reported. The diagnosis of biliary colic without jaundice is often not easily made. Many of the conditions resembling it may be excluded by careful examination and by attention to the history of the case.

Here I would like to refer to one condition—the differentiation of which has given me more trouble than any other, that is, spasmodic closure, of the pylorus accompanied by painful distention of the stomach. If the patient is seen during an attack the gastric distention may be made out. The presence of an increased amount of free hydrochloric acid in the gastric juice would lead one to believe that the stomach is the seat of the pain. An elevation of temperature is present in a greater number of cases of biliary colic than one would suppose from medical literature. Rigors with high fever and perspiration have been occasionally observed. These symptoms have been especially referred to by Dr. Osler under the head of "hepatic intermittent fever." This condition resembles urethral fever, and probably results from the absorption of toxines. It is important to remember that it may exist without the presence of suppuration.

Cases of biliary colic and spasmodic contraction of the gall bladder have been described in which calculi were not found. This is not uncommon. In some of these the calculus has already passed through. On the other hand, calculi sometimes pass through the cystic duct without pain or spasm. Jaundice does not take place in more than half the cases of biliary colic. Trousseau mentions a case in which jaundice did not occur until after four years, during which the patient had a great number of attacks of colic. Murchison has also reported a case in which daily attacks occurred for four months without the appearance of jaundice. Another case is given in which jaundice did not appear until after eight years had passed.

In many cases the calculus becomes engaged in the entrance of the cystic duct, and again falls back into the gall bladder. It is also probable that in some the stone remains in the same situation and only at times sets up a spasmodic contraction. The passage of the calculus is no doubt assisted by peristaltic action of the duct itself. The solution or breaking down of calculi does not often take place. Naunyn has in some cases observed evidences of the solution of concretions. It is quite probable, as has been mentioned by Dr. Adler (New York) that although marked jaundice is not present, in cases of occlusion of the cystic duct, a small amount of bile pigment may be

detected in careful examination of the urine. This I am convinced is a valuable diagnostic sign. The urine should be examined not once but on several successive days, and if bile pigment is frequently found, the hepatic origin of the trouble is made more obvious. In such cases the bile is probably absorbed through ulcerated surfaces, the result of the presence of calculi.

When the stone is arrested in the cystic duct, the completeness of the obstruction will sometimes depend on the direction of the axis of the stone. The change of axis may produce a decided change of symptoms. The question of the possibility of the formation of calculi in the cystic duct might be here referred to. Cases have been reported in which the concretions have increased in size after they passed into the duct, but none which would prove the origin of stones in that situation.

When the calculus becomes lodged in the cystic duct, a distention of the gall bladder takes place. If the obstruction is complete so that there is neither entrance nor egress for the bile, the viscus becomes distended with mucus and the bile staining gradually disappears. In some cases the calculus forms a ball valve and allows the entrance but not the exit of bile. According to Courvoisier's statistics, in 91 cases of distension of the gall bladder, due to calculary obstruction of the cystic duct, bile was found in 12 cases and watery fluid in 72. The distended gall bladder may reach the size of a child's head. A case is mentioned from which ten pints of fluid were removed. It is often larger than the kidney, and of a somewhat similar shape. In other cases it is narrow and tense, somewhat sausage-shaped, but very rigid. A few years ago a case of this kind came under my observation, in which the extremity of the gall bladder pressed against the abdominal walls producing a tumour not unlike a hernia. A cholecystotomy was done by Dr. Ross, a calculus removed, and the patient recovered.

It might be mentioned here that distension of the gall bladder sometimes takes place from atony of the walls when there is little or no obstruction. When from any cause ectasia of the gall bladder is present, an invasion of pyogenic organisms will produce a suppurative cholecystitis, and this may end in rupture or in general pyæmia. Again a simple catarrhal inflammation may take place, followed by contraction and atrophy. Atrophy occurs more frequently in calculous obstruction and distention in cases of carcinomata. In some such cases when pigment and bile salts are absent, cholesterine has been found, and the contents vary in consistence, being sometimes serous, mucous, or even of a cheesy character. Degenerated blood has also been found.

The diagnosis between a distended gall bladder and a displaced right kidney is often a matter of some difficulty. The points usually given are :

1. The history of biliary colic.
2. The movement of the tumour with respiration.
3. That the lower extremity is movable, whereas the upper is fixed.
4. That the kidney may be felt behind the distended gall bladder.
5. That the colon lies in front of the kidney and behind the gall bladder.
6. In pyonephrosis the urine may contain pus, and in distended gall bladder bile pigment may be present.

I shall now take the liberty of relating briefly two cases illustrating this difficulty of differentiation.

1. The patient, a married woman, 52 years of age, had suffered during the summer from occasional attacks of pain together with general malaise. In October a tumour was discovered below the liver, extending downwards nearly to the crest of the ilium. It was large, smooth, elastic and tender. The right kidney was displaced, as shown by absence of kidney dulness.

The patient was examined under chloroform, when the kidney could not be found separate from the tumour. The latter did not move with respiration, nor was the lower extremity any more movable than the upper. The urine was free from pus, and contained a small quantity of bile pigment. Symptoms of suppurative fever were present.

Dr. Temple operated, and found a distended suppurative gall bladder and a stone in the cystic duct. The patient made a good recovery.

2. A second case was seen by me last winter. The patient, a female, complained of severe pain in the gall bladder region, which was accompanied by a swelling immediately below the margin of the ninth and tenth ribs on the right side. The pain occurred irregularly at intervals of weeks or months, and was nearly always relieved by pressure over the region of tumefaction. The tumour, which was thought to be an enlarged gall bladder, was found to be a distended cystic kidney. The urine did not contain bile pigment nor any abnormal deposit. The length of time—eight years—during which the patient suffered from the pains should have decided against distended gall bladder. The patient was operated on by Dr. Ross, and recovery followed.

When the calculus has passed through the cystic duct, it usually finds its way through the larger bile duct without difficulty until it is obstructed by the narrow duodenal outlet. In many cases, however,

owing to the narrowing of the duct, the calculus is found in different parts of the canal.

Courvoisier has collected 123 cases in which the situation of the gall stone was noted. In the part near the liver, 17 cases ; in the middle part, 19 cases : near the duodenum, 20 cases ; close to the outlet, 41 cases ; the whole tube obstructed, 26 cases.

The symptoms caused by the passage of calculi through the common bile ducts are similar to those already described in connection with the cystic duct. Obstructive jaundice is the marked differential sign between the two conditions. The severity of the pain is equally great. Mayo Robson has reported a case in which death took place at the height of a paroxysm. A calculus was found partly extruded into the duodenum surrounded by some tense fibres of the sphincter.

On the other hand, calculi may pass through the natural channels without producing any special symptoms. Many such cases have been reported. It is probable that in some the ducts were dilated by the previous passage of a gall stone.

In cases of complete obstruction, the biliary ducts and gall bladder become very much distended with bile. The colouring matter is taken up by the lymphatics and jaundice supervenes. Harley has in recent years demonstrated that in such cases of obstruction the bile always finds its way into the blood vessels through the lymphatics. After a time the contents of the distended bile ducts lose the bile stain and become watery. The stagnation of bile often results in the precipitation of the bile pigment and the formation of pigmentary calculi.

The gall bladder is not so frequently distended in calculous obstruction of the common bile duct. In 87 cases collected by Courvoisier, ectasia of the gall bladder was present in 17, and contraction in 70. This is partly explained by the changes already described, which take place in chronic cases. In recent cases, however, the bile does not always flow back into the gall bladder, owing to a peculiar formation of Heister's valve. It is therefore quite possible to have a case of recent calculous obstruction of the choledoch ducts without enlargement of the gall bladder.

Cholelithiasis is now given as one of the causes of cirrhosis. Hanot in his classification gives two subdivisions of biliary cirrhosis—hypertrophic and calculous.

In many cases in which cirrhosis is found with cholelithiasis the increase of fibrous tissue may be due to other causes—alcohol, for instance. It has, however, been demonstrated that cirrhosis may be produced by cholelithiasis alone. The pressure of the bile in the dis-

tended ducts, as well as the irritation due to calculi in the extra and intrahepatic ducts, are probably the principal agents. In many cases the microbes and their products are an additional source of irritation.

Calculi are sometimes carried back from the choledoch ducts into the hepatic duct, when we may have obstructive jaundice without distension of the gall bladder.

The writer has noticed that in some cases the cystic and common hepatic ducts lie close together for the distance of one-half to one inch. In such patients, a calculus in one duct might cause obstruction of the other. Calculi may form in the intrahepatic biliary passages. These are usually of pigmentary character. Tait was of opinion that these pigmentary calculi passed down into the gall bladder and formed the nuclei of the ordinary gall stone. The symptoms of intrahepatic calculi are indefinite. In 22 cases (Courvoisier) out of 87 pain was present. Disturbances of the digestive functions were present in almost all cases, and in 26 there was an enlargement of the liver. In 6 jaundice was well marked, and in 35 it was present, but not intense.

In all cases of biliary obstruction from calculi there is a danger of the introduction and growth of pathogenic germs, leading to suppurative cholangitis and cholecystitis with the accompanying symptoms. Schroeder found purulent hepatitis is 9 out of 144 gall stone cases.

The pain in this condition is usually not severe, and although an abscess may form, it is not so large that it can be made out during life. Intrahepatic calculi are often found in large numbers in the abscess cavity. The abscesses may be small and multiple. There may be one large cavity, alone, or surrounded by smaller deposits of pus.

The bacteria most frequently found in such cases are the bacillus coli communis, streptococcus, the staphylococcus aureus, aud the diplococcus pneumoniæ.

Naunyn gives the following ways in which abscesses of the liver are formed as a result of cholelithiasis :

1. An empyema of the gall bladder may rupture into the liver.

2. In purulent cholangitis an ulceration of the walls of the ducts may perforate and spread into the surrounding hepatic tissue leading to abscess formation.

3. In Schüppel's hepatitis sequestris, a necrosis of hepatic cells takes place at the periphery of a lobule followed by suppuration at the edge of the necrosed portion.

4. The abscess may be of a metastatic or embolic character.

The diagnosis of calculous abscesses of the liver is always a matter of difficulty. The presence of rigours, with perspiration and sudden elevation of temperature, ar not sufficient, as these may occur in

gall stone cases when there is no suppuration, or they may be caused by suppurative cholangitis when there is no collection of pus. Loss of strength is usually more rapid, and the enlargement of the spleen is more marked when abscess is present. The hepatic tenderness, pain, and swelling are usually not sufficiently marked to differentiate abscess from cholangitis. Although all forms of suppurative disease of the liver are dangerous, when the process is confined to the bile ducts a complete recovery may take place after the removal of the obstruction.

The development of jaundice after biliary obstruction takes place in two or three days, and often the pigment may be found in the urine when there is no discoloration of the skin. Is there any method whereby the jaundice of cholelithiasis may be distinguished from that due to other forms of obstruction ?

Naunyn gives the following points in cholelithiasis :

1. In the continuous or occasional presence of bile in the fæces. 2. Distinct remissions in the intensity of the jaundice. 3. Normal size or only slight enlargement of the liver. 4. Absence of distension of the gall bladder. 5. Presence of febrile disturbance. 6. Duration of jaundice for more than a year.

The presence of fever is not always a differentiating sign between cholelithiasis and carcinoma. I had a case under observation a little more than a year ago in which rigours came on irregularly every few days, followed by hot and sweating stages. The patient, a man over 60 years of age, had suffered from malaria when young. The plasmodium was sought for and not found. No cause for the fever could be discovered. A few months later a carcinoma of the pylorus became apparent. Calculi in the common bile duct may give rise to many symptoms apart from those of obstruction. A perihepatitis may be produced, which, if pus germs are present, may end in a perihepatic abscess. Bands of adhesion may surround and occlude the pylorus and result in gastrectasis. A peculiar case of gastrectasis and gastric ulcer resulting from abscess came under my observation last winter.

The patient, a woman of 50, had had several attacks of biliary colic, from which she made a good recovery. In the month of May she had one which lasted longer, and from which she did not recover so completely. In August of the same year, after more than usual exertion, she was seized with obstinate vomiting, which continued until the time of her death in November. The vomited matter sometimes contained blood. During the last few weeks she was unable to

retain a teaspoonful of milk, and toxic symptoms occurred shortly before her death.

At the *post-mortem* examination a calculus was found in the ampulla Vateri, which partially obstructed the flow of bile and to some extent lessened the calibre of the duodenum. A duodenitis was produced, which extended through the pylorus, involving the left third of the mucous membrane of the stomach. An ulcer about the size of a large penny existed in the inflamed portion, not far from the pyloric opening.

Calculi in the gall bladder and biliary canals are often the cause of carcinoma. The very large proportion of cases of cancer of the gall bladder in which calculi are found is an evidence of this. Courvoisier found them present in 74, out of 84 cases, and Brodowski in every one of 40 cases.

In the bile ducts the most common seat of carcinoma is the duodenal end of the choledoch duct, which is also the part most frequently obstructed by gall stones. It is, therefore, not surprising that symptoms of cancer of the gall bladder and biliary ducts are often preceded by those of cholelithiasis. The frequency of the combination of cholelithiasis with diabetes has been referred to by Ord. Sometimes sugar in the urine follows an attack of biliary colic. This latter circumstance has given rise to the theory that cholelithiasis is a cause of diabetes. It is, however, more probable that the pathological conditions which give rise to diabetes may also tend to the development of biliary concretions. Naunyn observes that the absence of glycosuria previous to the attack has not been proved in any of the cases in which sugar was found after an attack. It is, therefore, quite possible that these have been really cases of diabetes.

Pernicious anæmia has been known to follow biliary obstruction in a number of instances. This may arise from bile circulating in the blood or more likely from the presence of toxins, the result of microbes in the biliary passages. It is also probable that the function of the liver as a guard against the introduction of intestinal poisons is much impaired, and that the presence of these in the general circulation results in a destruction of red corpuscles.

Hintze has mentioned a case of cholelithiasis in which gas was found in the liver. This may have resulted from the presence of bacillus coli communis or from the bacillus aërogenis capsulatus. Gall stones are occasionally the cause of gastric and intestinal obstruction. Cases of pyloric obstruction have been reported by Pepper, Fiedler, and others. In most of these a diagnosis of carcinoma had been made.

In 1889 Schreiber of Königsberg, operated on a case of pyloric stenosis in which a calculus was found at the base of an ulcer. A complete recovery followed.

Biliary concretions which pass through the common duct are usually too small to produce obstruction unless they remain in the intestine and become increased in size by additional deposit. Calculi may exist in the intestine a number of years before producing symptoms. A case is recorded in which in all probability a gall stone passed into the bowel fifteen years before signs of obstruction appeared. Calculi which pass through fistulous openings are often large enough to cause obstruction at once. On the other hand, very large stones may pass through the bowel without producing any marked symptoms. A case is given by Naunyn (Blackburn's) in which the calculus measured $3\frac{9}{16}$ by $1\frac{9}{16}$ inches. In some cases either because the ulceration into the intestine takes place without pain or the stone has remained for a time in the intestine, an attack of acute intestinal obstruction takes place when a patient is in good health. Dr. Draper of New York has reported two such cases. The patients were seized with acute abdominal pain when in the enjoyment of good health. The diagnosis was made in both cases. In one an early operation saved the patient. In the other surgical interference was delayed at the solicitation of friends until it was too late to effect a cure.

Gall stones in the ileum is five times more frequent in women than in men. In Lobstein's 66 cases 46 were women, and 74 per cent. were women in Schiller's cases. In Schiller's 108 cases, 4 were under 30 years, 5 between 30 and 40, 99 were over 40.

The seat of obstruction in 10 out of 75 cases has been the ileo cæcal valve or a little above it. In 43 it was within an inch of the valve, whereas in 6 it was found in the large intestine either at the sigmoid flexure or below it. In the small intestine the stone may first obstruct the circulation and then ulcerate through, either producing a fatal inflammation, an abscess, or an appendicitis. A small calculus has been known to find its way into the appendix producing fatal inflammation. In most cases the symptoms of obstruction are of an acute character, but in some the development is chronic. The diagnosis from other forms of obstruction is made from close attention to the history of the case. Flatus more often passes this than other forms of obstruction. The situation in the small intestine may be diagnosed by the more persistent vomiting and by the presence of an excess of indican in the urine. The presence of a tumour near the cæcal valve is often noticed. The mortality of gall stone ileus is very great, about 40 per cent.

Having described the passage of gall stones through the ordinary

channels, I shall now refer to the various kinds of fistula which are sometimes produced. (Page 144 Naunyn).

	Roth.	Schröeder.	Schloth.	Total.
Total of Necropsies	5403	1150	4313	10866
Gall stones present in	535	150	343	1029
Perforations into the peritoneum	..	1	2	3
(*a*) of gall bladder	..	—	2	3
(*b*) of cystic duct (rupture)	..	1	—	1
Fistulæ :				
(*a*) between the several bile ducts	..	—	1	1
(*b*) between gall bladder and liver	..	—	1	1
(*c*) between gall bladder and stomach	..	1	—	1
(*d*) between gall bladder and duodenum	12	1	6	19
(*e*) between gall bladder and colon	8	5	3	16
(*f*) between common duct and duodenum	5	—	—	5

The calculus usually passes through the walls of the gall bladder by ulceration. Adhesive inflammation precedes the exit, so that the stone when it leaves the viscus is surrounded by connective tissue. An abscess may form or the process may be accompanied by little suppuration. When abcesses occur the symptoms are similar to those of suppuration elsewhere, for instance, to those following appendicitis.

Biliary fistulæ may extend upwards, perforate the diaphragm into the pleural cavity or into the lung, forming in the latter case a broncho-biliary fistula. Bile may then be coughed up in large quantities, and in some instances calculi have been expelled in this way. These fistulæ may connect directly with the gall bladder or may arise from the abscess in the liver itself connected with dilated bile ducts.

A case has been recorded of perforation into the left pleura, into the mediastinum, and then into the pericardium. Perforation may take place into the stomach, when the calculi may be expelled by vomiting. In most cases when calculi are vomited they are regurgitated into the stomach from the duodenum. Fistulous openings into the duodenum and colon are comparatively frequent. These may originate in the intrahepatic and extrahepatic ducts and in the gall bladder, generally in the latter. The entrance may take place in any part of the intestine, and occasionally there are two openings communicating with one sinus. An opening into the portal vein occasionally takes place, resulting in fatal hæmorrhage.

Biliary fistulæ perforating the abdominal walls usually originate in the gall bladder, and are the result of a suppurative cholecystitis. When the cystic duct is obstructed a mucous or purulent discharge takes place from the opening. When the cystic duct is open and the common bile duct obstructed large quantities of bile may pass through the fistulæ. These passages are usually tortuous, and may open in

the right hypochondriac region, but more frequently in the vicinity of the umbilicus. Richet has described an umbilical channel commencing at the entrance of the obliterated umbilical vein into the liver and ending in the navel. It is from $1\frac{1}{4}$ inch to $2\frac{3}{8}$ inches in length, Fistulæ often follow this course.

Calculi are often discharged in large numbers. The fistulæ may last for years, but in the majority of cases a deterioration of health or tuberculosis supervenes. It was formerly thought that this debility was due to absence of bile in the intestines. It has, however, been found that animals with external biliary fistulæ thrive well, and cases have been recorded of patients living many years after their formation. In Harley's case the patient died at 74, and during the last eight years an external biliary fistula had existed. The deterioration of health is probably due to the absorption of toxins from the fistulous surface. Fistulous communication may exist between the gall bladder and the pelvis of the kidney, so that a gall stone may give rise to renal colic. Openings into the uterus and vagina have also been reported.

When a gall stone is arrested for a long time in the duct, ulceration of the mucous surface may take place, which, after the stone has passed out, may produce a permanent stricture. When the hepatic and common bile ducts are involved chronic, obstructive jaundice may result.

III.—Henry Handford, M.D.
Physician, Nottingham General Hospital.

Dr. Handford was much interested to hear of the observations which had been related as to the causal relation of typhoid fever to cholelithiasis. In Nottingham typhoid fever was very prevalent, but out of 300 hospital cases of which the speaker had notes no single case of jaundice was recorded, nor any instance of biliary colic sufficient to attract the notice of the attending physician. Dr. Hunter's description of the method of formation of gall stones explained their not infrequent occurrence in young people, a matter which had caused much surprise. A few months ago a case of perforated gastric ulcer in a girl of sixteen was operated upon by a surgical colleague and died at the end of a month. *Post mortem*, a single gall stone the size of a small walnut occupied the contracted gall bladder. There had been no symptom whatever of the presence of gall stones. A point which had not been alluded to was the occurrence, in some cases of persistent jaundice, of intense toxæmia leading to hæmorrhages, unusual susceptibility to morphine, and death; whereas in other instances jaundice

might continue for years without any such blood disorganisation. As an illustration the speaker mentioned the case of a lady, 60 years of age, who had suffered from deep jaundice without intermission for four and a-half years, and at the end of that time was in better health than at the beginning, and able to walk and drive about, the jaundice notwithstanding. The rarity with which gall stones are found in the evacuations of the alimentary canal, even when properly searched for in well managed hospitals, compared with the frequency of hepatic colic had convinced the speaker that many cases of colic could not be due to gall stones, but to some simpler form of mechanical obstruction. The only other explanation was that the stones disintegrated in the alimentary canal and of that we had little or no evidence.

IV.—John A. Mullin, M.D., Hamilton Ont.

Dr. Mullin expressed regret that the part of Dr. Graham's paper referring to the early diagnosis of gall stones had not been read at an earlier part of the paper as we need not expect light from surgery in the early stages. Two cases were referred to where surgeons in operating had failed to find gall stones which *post-mortem* examinations made soon afterwards disclosed. Reference was also made to his clinical experience which did not show any case of cholelithiasis occurring in patients who had suffered from typhoid fever, and expressed doubt respecting the propriety of tracing pathological conditions to the typhoid bacillus even though that organism was present.

V.—Gustave Baumgarten, M.D., St. Louis.

I did not intend to take part in this disscussion, for which I am unprepared. I shall refer only to two points. The connection between malignant disease and cholelithiasis has not been alluded to. While it is granted that the presence of gall stones may become the proximate cause of cancer of the gall bladder or ducts, there are also cases which, by clinical evidence, give the impression that the carcinoma may be the primary condition, that is, may be one of the causes of the formation of gall stones. The second point refers to rupture of the gall bladder in cholelithiasis ; this occurs from distension of the cystic walls, or from ulceration at the site of the calculus. But I have observed a case in which neither of these conditions was present to account for the rupture. A gentleman, aged 55, careless of his health, had had many most violent attacks of gall stone colic. He died of acute general peritonitis two days from its sudden incipiency in the midst of health. The diagnosis of peritonitis from perforation

was verified at the *post mortem*, and its cause was found to be a perforation of the gall bladder by a pin-point opening. The gall bladder showed no marks of undue extension, nor of any inflammation or ulceration whatever. In a spot, the size of a pea, of which the perforation was the centre, the muscular coat of the gall bladder was absent, but the parts around the opening were not roughened, nor thickened, and showed histological evidence of neither inflammation nor rupture. The common duct was thickened, dilated in parts, and at the distal side of the largest dilatation was a stricture due to previous ulcerations. In the dilated portions of the duct and in the cystic duct were found several gall stones.

VI.—Angus Mackinnon, M.D., Guelph, Ontario.

Dr. Mackinnon expressed a great interest in the discussion of this subject, and felt pleased that attention was drawn to the relation of typhoid fever to cholelithiasis. During the past year two cases of suppurative inflammation of the gall bladder occurred in his practice, one a woman, aged 27, six weeks after recovery from typhoid. The second, in a woman, aged 40, and within four months of an attack of typhoid. In both there were a number of calculi in the gall bladder. It was only within the past few years that this relation of typhoid fever to gall stone had been observed. We had all had more or less experience with typhoid, but until recently no cases of gall stone were known to follow it.

VII.—W. Pasteur, M.D., F.R.C.P.,
Assistant Physician, Middlesex Hospital.

Dr. Pasteur wished to illustrate the great difficulty attending the diagnosis of some cases by referring to a patient recently under his care. He felt convinced that the greater frequency and safety of exploratory operations of the abdomen would largely increase our accuracy of diagnosis in cases of this nature. The patient in question was a man of 50 years of age, with good antecedents, who had lived a fairly active, sober life. Of late years there had been a decided tendency to obesity. He was seized some four months ago with acute pain in the region of the gall bladder with vomiting of a considerable quantity of blood. The attack passed off in a few hours, and was not followed by jaundice. In the course of the next six weeks the patient suffered from many attacks of a similar nature, gradually increasing in frequency and in severity. He lost weight rapidly, and was unable to take any solid food without determining an attack of colic.

There was never any jaundice. When seen by the writer some weeks after the onset no enlargement of liver, gall bladder, or spleen could be made out. The history of the attacks seemed to leave no doubt that the trouble lay in or near the gall bladder. An exploratory incision made by Mr. Pearce Gould revealed the following conditions: The liver was small and drawn up behind the ribs so that it was only reached with much difficulty. There was some thickening at the site of the gall bladder, but no calculi could be felt, nor could the viscus be made out. The pylorus was surrounded by adhesions and fixed to the under surface of the liver. These were divided with much difficulty and the pylorus relieved. The patient made an excellent recovery and was in perfect health and gaining weight steadily more than two months after the operation.

VIII.—Edmond Rogers, M.D., Denver.

Dr. Rogers mentioned a case (already reported) of an operation on a woman, aged 35, who suffered over a long period from attacks generally of a suppurative cholecystitis. These attacks were frequent and terrible in their severity—repeated chills, very high fever, local pains, tenderness, jaundice, etc. The gall bladder was found empty and contracted to about one-third its ordinary size; the liver was small and high up, but no stone was present. Cholecystduodenostomy was performed with a Murphy button. The patient died a few days after in an acute attack, when the *post mortem* showed a local atrophy, but no stone. There was, however, a stricture of the ileum, which caused incomplete obstruction. There was no peritonitis, and the condition at the seat of operation was surgically satisfactory.

IX—George Acheson, M.B., Galt. Ont.

Dr. Acheson said that as regards etiology, he thought that the presence of lime salts in the drinking water had an important bearing. He asked Dr. Hunter whether he had noticed this connection.

X.—W. J. Campeau, M.D., Harrow, Ont.

Dr. Campeau emphasised the difficulty of diagnosis in many cases and the necessity of calling in the aid of a surgeon.

XI.—Stephen Mackenzie, M.D., F.R.C.P.,
Physician to the London Hospital, President of the Section.

The President alluded to the great value of the papers of the introducers of the discussion. To Dr. William Hunter the section was greatly indebted for an exceedingly able exposition of the chemico-

pathology of gall stones, largely the results of his own original work. To Dr. Graham they were indebted for a most complete and valuable consideration of the causes and effects, clinical and pathological, of gall stones. One of the most interesting points brought out by the discussion was the relation of enteric fever to jaundice and suppurative inflammations of the biliary passages, which, he thought would prove, now attention was drawn to it, more common than appeared at present. He thought there was a danger in assuming biliary colic may occur without calculus or other mechanical obstruction, and he narrated a case in which cholecystotomy had been performed for repeated attacks of biliary colic, but no calculus was discovered. Later the patient had another and equally severe attack of biliary colic and jaundice. She came some months after in triumph with a calculus she had passed.

A CASE OF TYPHOIDAL CHOLECYSTITIS WITH CHOLELITHIASIS.[1]

BY

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AND

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Cases of typhoidal infection of the gall-bladder are, on the whole, not so very uncommon, and during the present year not a little attention has been paid to them in the recent papers of Dr. Osler and Dr. Mason at the last annual meeting of the Association of American Physicians. So far as we are aware, however, no cases of the kind have been brought to the notice of this Society, and the present communication is presented, inasmuch as its clinical interest is certainly worthy of some attention. The following are the notable features :

1. A suppurative cholecystitis in the course of typhoid fever and originating from the presence of typhoid bacilli in pure culture in the gall-bladder.

3. The difficulties and special features of diagnosis of an infected gall-bladder complicating typhoid fever.

3. The mode in which the complication affects the course of the malady.

4. The means of treatment and the effects of the complication.

The patient concerned was a female, aged 35, a typewriter by occupation. She was admitted to the Royal Victoria Hospital on the 21st of September, having been treated previously for nearly three weeks by Dr. Deeks. Her symptoms during that time had been not unlike those of enteric fever, viz., general malaise, insomnia, remittent fever, enlarged spleen and gastro-intestinal disturbances.

On the day previous to admission, however, diarrhæa set in with clay-coloured stools. There was severe pain in the abdomen, referred to the right side near the umbilicus, the temperature within a very few hours dropped from 102° to 98°, and the pinched facies expressed great anxiety. The pulse, however, was good and not notably increased in rapidity.

[1] The present case occurred while the Retrospect on similar conditions which appears in this number was being written.

Professor Stewart, who saw the case in consultation, advised her removal to the hospital, and described the condition then somewhat as follows :

The temperature was 98⅖°, pulse 90, and the respirations 24 per minute. She was poorly nourished, evidently suffered intermittent pain, had a grayish coated tongue, anorexia, and the diarrhœa above described. There was no jaundice. Examination of the abdomen revealed slight redness over the right hypochondrium and a scarcely perceptible œdema. Pressure on the ribs induced tenderness, but no friction rub could be felt on palpation. Immediately below the ribs, a large mass was detected continuous with the liver and extending down as far as 2 to 3 cm. below the umbilicus, situated towards the median line and its right border slightly external to the right rectus muscle. Percussion over this area produced a modified dullness with some slight tympany. From above downwards the hepatic dulness began at the 6th rib. Pressure behind gave slight tenderness in the right line, but elsewhere there was no evidence of disease. The urine showed a trace of albumen, but no bile. The blood on examination for the Pfeiffer test, both at the laboratory of the Royal Victoria Hospital and at the General Hospital gave a positive reaction for typhoid. For the next three days the condition remained comparatively unaltered, except slightly increased rigidity and distension : surgical interference being deemed advisable Doctors Garrow, Bell and Roddick were consulted, and the questions of diagnosis and treatment considered. While it was comparatively easy to exclude impaction of fæces, affections of the kidney and perforation from typhoid, the question of subcutaneous phlegmon, appendicitis and infection of the bile passages gave rise to considerable hesitation in the diagnosis. That cellulitis was present seemed more than likely from the marked œdema which had gradually developed in the abdominal wall ; while, at the same time, some more deeply-seated condition was also judged to be present. The mass itself, apart from the presence of what seemed a tongue of liver tissue coming down in the right hypochondrium, could not be definitely defined, and no distinct fluctuation was apparent. The symptoms, with the clinical history, pointed rather to some infection of the gall bladder than to appendicitis. The ultimate diagnosis was that of cholecystitis and cholelithiasis and operation was urged.

An incision was made in the right semi-lunar line, and the distended gall-bladder exposed lying amid a quantity of lymph due to a local plastic peritonitis. Adhesions of the gall-bladder were observed on all sides, but as yet no perforation of the organ had taken place.

Upon tapping, turbid grayish-green fluid was removed, and subsequently the gall-bladder itself was incised, and 150 small facetted cholesterin calculi were removed. The margin of the artificial opening in the gall-bladder was next stitched to the peritoneum and the usual surgical toilet performed.

The patient, however, failed to recover well from the operation, and at the end of the second day succumbed to the disease. Only a partial autopsy was permitted, but sufficient to show the typical lesions of typhoid fever in the intestines and the subacute inflammation of the gall-bladder itself with the more or less subacute pericholecystitis.

Cultures were obtained at operation from the gall-bladder and micro-organisms obtained which responded to all the tests for the B. typhosus. The fluid itself when examined in the fresh state revealed actively motile bacilli which agglutinated and became stationary when brought into contact with the blood serum of a patient affected with typhoid fever. The bacilli when later cultivated gave the same reaction of Pfeiffer, thus establishing beyond a doubt the identity of the microbe present in the gall-bladder. In addition to our own investigations, Dr. J. G. Macdougall made entirely independent tests and likewise identified the bacteria as those of enteric fever in pure culture.

In orienting ourselves again as to the special features in the diagnosis, there are several which in a way were seemingly characteristic.

The sudden alteration in the course of the disease, with development of a subnormal temperature, and sudden pain in the abdomen might have suggested perforation of the intestine, but the pulse remaining quiet and strong this was practically excluded. The symptoms, too, were intermittent, with periods of comparative freedom from pain and anxiety, which too has been a feature prominent in many similar cases of typhoidal cholecystitis. Add to this the tongue of liver pulled down by the gall-bladder, as first shown by Riedl, and we have a series of suggestive symptoms for the diagnosis. Jaundice was, of course, not to be expected as the bile passages elsewhere remained free.

The question of operation, while always a grave matter in cases of typhoid fever, was here a positive necessity, and from the thinned condition of the gall-bladder wall had undoubtedly anticipated an impending perforation. While the case recorded by Mason of successful tapping of the gall-bladder in a somewhat similar instance is of remarkable interest, yet the presence of calculi in our own case necessitated a more radical means of treatment.

ORGANIC HEART DISEASE.

BY

SIR JAMES GRANT, M.D., F.R.C.P., (Lond.),

Consulting Physician, General Hospital, Ottawa.

I thank you for the opportunity of making a few observations on the heart and organic cardiac disease this evening. Foster says the heart is a *valvular pump*, which works on mechanical principles, the motive power of which is supplied by the contraction of its muscular fibres. The frequency, force and character of the beat, with a given quantity of blood ejected at each beat, are the problems involved in mechanical action. The vital problems are chiefly associated with the correlation of the forces controlling the frequency, force and character of the beat. Cardiac impulse is found to be synchronous with the systole of the ventricle, and is felt in the normal state on the fifth costal interspace, about an inch below and a little to the median side of the left nipple. To trace out the entire list of organic cardiac diseases I feel confident is not the task assigned to me this evening, but rather to confine my observations to a few lines of thought, as far as the generalities of cardiac diseases are concerned. This centre of circulating vital force, charmed into action during the stage of utero-gestation and continuing into the seventies, eighties and nineties, uninterrupted, is a subject attractive beyond expression, and wrapped in the self-same mysterious agency, which guides and directs the processes of vitality as a whole. The chief line of thought for this evening's remarks will be as to the bearings of chronic heart disease on the parturient system. The effect of two hearts operating at one and the same time, in the same system, is a subject calculated to attract attention, and chiefly on account of the exceedingly important issues at stake. The physician in every day practice and the physician accoucheur, rarely in our larger centres, have an opportunity of following up consecutively, the entire manifestations of such abnormal cardiac conditions. Such, however, is not the case in smaller centres, where the entire rationale of such manifestations can be followed out consecutively. First, then, what are the normal changes occurring in the heart during pregnancy? The first great question in cardiac disease during the parturient period, was raised by the French school. Whether the left ventricle of the heart does or does not normally

[1] Read before the Medical Society of Ottawa, Nov. 10th, 1897.

hypertrophy during pregnancy. Larcher in 1825 and 1826, while serving as *interne* in the Paris Maternity Hospital, first directed attention to the fact that the left ventricle of the heart normally becomes hypertrophied during pregnancy. He examined during three years fully 130 hearts of patients who died at the hospital, the majority of them of child-bed fever. The ages of the patients varied from 18 to 35 years. From his observations he concluded that the heart in the human species is normally enlarged during the period of gestation; that the enlargement affects almost exclusively the left ventricle; the left auricle; the right side of the heart being little if at all changed, and lastly that it varies in amount, from a minimum of one-quarter of the normal thickness of the ventricle to a maximum of one-third of it; that it constantly occurs and that it disappears but slowly during the period of lactation. Larcher also inclined to the belief, that repeated pregnancies, within short periods, particularly if at the same time they suckled their children, might give rise, even in a perfectly sound heart, in all its openings, to permanent hypertrophy. It is now a well recognized fact, that the pregnant condition modifies and affects the conditions of the collective blood vascular system in a most important manner, influencing thus very materially diseases of the lungs, kidneys, etc., existing at one and the same time. Larcher's views were first published in 1828, and a full record was addressed to the Academy of Science, Paris, April 6th, 1857. This subject attracted very considerable attention and investigation, at the hands of Drs. Bean, Ducrest and Bizot, who fully endorsed the views of Dr. Larcher and give the mean thickness of the left ventricle as averaging from 1.0 per cent. to 1.5 per cent. and $1\frac{1}{2}$ per cent. Dr. Blot did not confine his observations to measurements of thickness alone of the walls, but by an examination of 12 hearts of women who died during pregnancy, in the lying-in-period, he found the average weight to be 9 ounces 38 grains troy weight, whereas the average weight of the healthy heart of young women is about 7 ounces 120 grains troy weight. It would thus appear, according to Mr. Blot, that the heart of the pregnant female gains in weight fully $\frac{1}{5}$ during pregnancy, and that the hypertrophy is confined almost entirely to the left ventricle. Dr. Fritsch the great German authority (*Archives of Gynœcology*) is inclined to doubt the statements of the French authorities and to explain a considerable amount of the increased dullness, by upward and forward displacement of the heart, from the pushing of the diaphragm, and also inclines to the belief, that the statements of the French authorities as to increased muscular tissue, in the left ventricle during pregnancy, are considerably overdrawn. Fritsch although

adhering partially to the view that there is normally some enlargement during pregnancy, is somewhat skeptical as to eccentric hypertrophy of the muscular tissue of the left heart, and inclines to the belief that a passive dilatation of the organ, of a slight amount, is sufficient to account for the necessities of the case. This same authority makes a statement somewhat contradictory, that in general the hearts of lying-in-women, on post-mortem examination, appear larger, yet one would require to take accurate weights and measurements of them. In my humble opinion, conclusions accurate in character, cannot be arrived at, without both weight and measurement, such as the French authorities have most carefully performed. Herman Lobléin meets Blot's deductions from the increased weights of hearts of pregnant women, by the results of an examination of the hearts of 9 women who had died in the Gynæcological Clinique at Berlin, during the previous year. Death in these cases was due to rupture of the uterus, or some other acute cause, terminating life within a few days after delivery. The average weight of these hearts, he found to be 247 grms; while according to Blot, the weight of the heart of the pregnant female, is to that of the non-pregnant female, as 290.95 to 220 23 grms. He argued that the average weight of the hearts of pregnant females would be found not greater than the average weight of hearts of non-pregnant females. He argues that authors in maintaining the existence of hypertrophy of the left heart, have clinically bestowed too exclusive attention to the cardiac dullness, which from the upward displacement of the heart in the course of the pregnancy is specially liable to mislead, and have not noticed whether the cardiac impulse was found to be intensified, the first sound at the apex specially loud, the second aortic sound accentuated, the radial pulse hard and difficult to compress, or whether the open beat was thrown outwards and downwards, from its normal situation. Doubtless (says Lobléin) the absence of all clinical symptoms, by which we recognize the hypertrophy of the cardiac muscle, is the rule at the end of the normal pregnancy; its occurrence on the other hand he considers the exception. Still notwithstanding the strong negative statements of Lobléin, Professor Angus Macdonald of Edinburgh says he cannot help feeling convinced that in the latter months of pregnancy in the case of women with normally sized hearts, there is a certain amount of such hypertrophy. Peacock in his tables of the weight of the healthy hearts of females dying between the ages of 20 and 55 years, favours the doctrine of there being a certain degree of hypertrophy in the hearts of parturient females. Considering the entire circumstances, a certain amount of cardiac hypertrophy, is very likely, by

the existence of greater work for the heart to perform during pregnancy, and more particularly as there is an undoubted arterial tension in the latter months of pregnancy, as has been ably demonstrated by the sphygmograph in the hands of Mahomed, Meyburg, Marey, and Blot (*Archives of Gynæcology*). What stronger evidence could we desire as proof of exalted venous tension, than the various varicosities during pregnancy, which point to abnormally high tension during the parturient period. The abnormal demand for blood at that time, and the circulation in the heart in a given period, gives rise to a demand for increased cardiac force, as the result of which, an hypertrophic cardiac condition, such as ably defined, might very naturally follow. After careful analysis of the literature on this subject I am disposed to accept the opinion, that we have reason to believe, that in the left ventricle during pregnancy, there is a certain degree of increase in its capacity, associated with a variable amount of muscular hypertrophy in its walls. The parturient state is one marked by well defined systemic changes, and in the development and progress of such it is well to note the part played by cardiac action, when any abnormality is known to exist. The successful issue in a case of pregnancy depends much on watchfulness through the entire period of uterogestation, and it becomes even much more so if any line of diseased action is known to exist. The correlation of the forces as to the mutual bearings of cardiac disease and pregnancy are all important. Hecker (*Leipsig Clinic* 1860) states, that the danger to women who suffer from valvular lesions, determined by pregnancy and parturition, is capable of developing itself in two directions. First, during the latter months of pregnancy, the thoracic space is narrowed, and *the lungs*, embarrassed by cardiac lesion, frequently become functionally unable through serous effusion, and life's activity closed ; or the heart becomes so used up by the exertions of labour, that its disturbed mechanism comes to an end. Hecker, Dohrn and Fabius (of Leipsig) incline to the belief, that while the perpendicular axis of the thoracic cavity is diminished during the latter months of pregnancy, and likewise its antero-posterior axis, at the lower part of the cavity, the tranverse diameter is at the same time much increased, so that as a whole, the cavity is not at all or very triflingly diminished, except some pathological condition is present, such as abdominal or chest dropsy. The important fact is that the general belief of the profession inclines to the idea that the diminution in vital capacity of the lung's condition by normal pregnancy is very immaterial indeed.

Of the many authors who have written on this subject by far th most original and important observations have been made by Prof.

Spiegelberg in 1871-72 (*Medical Union*—Lecture by Peter, Hospital de la Charité, Nov. 1871). "I wish to speak to-day of facts of which "the authors of treatises on diseases of the heart, have left in the " shade, and which authors of treatises of obstetrics seem to me to " have entirely forgotten; those facts are the pulmonary accidents to " which pregnancy exposes women affected with diseases of the heart." He recommends the greatest care as to movements and exposure, supposing a patient with heart disease becomes pregnant, the avoidance of pregnancy in future, and avoidance of lactation in all cases as well to escape any abnormal strain on the heart. Fritsch denies the correctness of Spiegelberg's views relative to diminished aortic tension. He is of opinion that the sudden accidents that arise from heart disease during child-bed, are due to defective cardiac compensation, being unable to meet the conditions introduced by the suddenly altered relative pressure, although he disagrees with Spiegelberg as to the manner in which it acts. The healthy heart can meet these extra requirements but the diseased organ suffers from imperfect power of accommodation to the demands upon it. Valvular lesions are very apt to be altered for the worse during pregnancy, of which we have evidence in the readiness with which pregnant women with unsound hearts, suffer from puerperal endocarditis. An important conclusion arrived at by Spiegelberg is, that the placental circulation is capable of giving little obstruction to the general circulation, but may operate injuriously with other evil influences, such as compression of the chest, bronchitis, pneumonia or pleurisy, in aggravating the evil effects of even a slightly dilated right ventricle. Of fifteen cases of labour, complicated with heart disease which he treated, only one of the patients died during delivery from pulmonary œdema. He comes to the conclusion that in most cases of heart disease death does not take place during delivery. From all the facts I have been able to bring before you this evening it is evident that pregnancy is likely to introduce serious complications in the condition of a patient suffering from chronic heart disease, except the lesion is not of very recent origin, which is a very extenuating circumstance.

Professor J. H. Musser of the University of Pennsylvania, in his recent address before the British Medical Association, Montreal, called attention to one of the most interesting and attractive points in cardiac disease, namely the disappearance of endocardial murmurs of organic origin. It is the permanency usually of organic heart disease which serves to distinguish between the murmurs of anæmia, or of incompetency from dilatation. It has however become a well recognized fact, that organic murmurs often appear and disappear from various circumstances, such as change of position and rest.

Even temporary disappearance of the murmur is believed to be due to the extreme dilatation, and consequent debility of the heart muscle. Aortic murmurs rarely disappear under such circumstances.

It is to this class of cases of heart disease, without murmur, that Fagge applied the term "Sandy desert of cardiac pathology." That the murmur of mitral obstruction may be temporary or permanent, the chief authorities on cardiac disease favour this view, and Osler adverts to the disappearance of murmur with rupture of compensation. Dr. Gee favours the idea that even in aortic regurgitation in which organic murmur is the most peristent, the sound producing power may disappear when the heart falls into a state of systole. There are also various pathological conditions which govern valvular hæmatic action, all of which render the subject most attractive. The sound produced by even mitral regurgitation, has been known to be wanting, disappearing suddenly in the most unexpected manner. Such murmurs disappearing are usually inorganic. Walsh has pointed out the disappearance of this murmur in chorea. The irregularities in mitral regurgitation so far noted, are connected with some organic heart condition, and modified or otherwise by the peculiar circumstances of the case.

The disappearance of endocardial murmurs cannot be observed too cautiously, in forming an opinion as to the existence or non-existence of organic disease. Sansom (British Medical Journal, Oct. 16, 1897) states that the signs of structural disease of the heart have borne no proportion to the degree of cardiac tumult, and that in every such case there should be a careful investigation of the nervous system, more especially in its relation with the cardiac reflex. The most frequent form thought to be almost entirely nervous is tachycardia, which I have found usually paroxysmal in character. I wish to refer briefly to the mountain cure of heart disease. In March, 1887, at Leeds, Dr. Clifford Allbutt called attention to the growing practice of recommending exercise rather than perfect rest, in some cases of heart disease, and described the German plan of graduated exercise by ascending hills, known as the mountain cure. Dr. Allbutt remarked that cases for this treatment must be very carefully selected, as such treatment should be avoided in cases of aortic regurgitation or atrophic conditions of the heart.

In conclusion let me say, there is an impression with the public, that disease of the heart usually means sudden death, to the person so afflicted. Such however, has not been my experience, and the following case, I now cite as an illustration of that fact.

J. S., aged 36 years, of robust habit of body, active, energetic and

able to endure almost any degree of physical exertion, being known as an expert skuller, of healthy parentage, and no tendency in family to hereditary disease. Thirty-four years ago the late Dr. Campbell of Montreal, diagnosed cardiac disease in this case. From 1880 to 1892, he had periodic attacks of acute rheumatism and erysipelas, chiefly of the scalp and legs. When first examined, I found well defined mitral stenosis with cardiac murmurs audible in almost any part of the chest, but most acutely in the pericardial region. To have lived such a length of time, and performed his usual official duties, as an architect, was to me a subject of much interest, and the conclusion arrived at, is, that in cardiac disease caution should be exercised in giving a positive opinion, as to the inability of the individual under such circumstances. In the present case, it is evident the abnormal changes, giving rise to the murmurs were very slow and progressive in character, having taken fully 30 years to compromise seriously the integrity or function of the mitral valves.

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ON CLIMATOLOGY.

AN ADDRESS BEFORE THE POST GRADUATE CLASS IN THE MEDICAL FACULTY OF McGILL UNIVERSITY, MONTREAL.

BY

S. Edwin Solly, M.D., M.R.C.S.

Late President of the American Climatological Association.

It is with the greatest pleasure, that I accept the invitation to address you, in this eminent seat of learning, upon the subject of the influence of change of climate upon the progress of phthisis. This pleasure comes not only through my appreciation of the honour thus conferred, but more especially because of your recognition of the importance of medical climatology, that belated sister of the sciences, who through her dallying with empiricism has been so long shut out, like a foolish virgin, from the halls of light and learning.

The exclusion from the medical schools of the systematic and adequate study of climatology has doubtless been somewhat justified ; for the reason that reports based upon essential facts and scientific observations were so few and so overwhelmed by a farrago of interested and unreasonable assertions, and poetic and one-sided descriptions, that the placing of instruction in medical climatology upon a scientific basis has seemed in the past a task well-nigh impossible. Now, however, the number of facts, both meteorological and clinical, recorded by eminent and honest climatologists, and by government weather bureaus, is such that scientific principles can be deduced, and the student and practitioner of medicine be taught to decide upon change of air for an invalid upon rational instead of empirical grounds.

Meteorological data are the first essentials upon which to base knowledge of a climate. Next in importance come the soil, the water, drainage, aspect and exposure to sun and wind, relation to seas and lakes, mountains and plains, and last, but not least, the resources for good board and lodging, exercise, amusement and occupation. Further: when these facts are obtainable for a given report, they must be compared with similar facts concerning other places. In the majority of reports, there is a lack of facts upon which to base a reasonable comparison, and so much likeness of description, that the physician is puzzled, and, in despair, is almost tempted to toss up for a choice.

It is ridiculous when you consider it, that, year after year, the profession and the laity will allow themselves to be allured into patronis-

ing health resorts where the inhabitants are too ignorant, or too lazy, or too much fear exposure of some of their pretensions, to gather and publish the essential facts concerning their localities. Such places deserve to be boycotted; but, alas, when looking at the number of much frequented resorts to which I refer in my work on Climatology, which are barren of such information, I feel that, in this respect, our climatic armamentarium resembles the shop of the poor apothecary in its beggarly account of empty shelves, and that the boycott would, therefore, be a failure.

Each one of us can, in our separate sphere, do something for this cause; and also by insisting on the importance of the recording of weather observations by the local and the government officials, and of the taking, digesting and publishing of notes concerning their patients by physicians who send patients to the resorts, and by the physicians who treat them when there, we may, by our combined efforts, lead climatology out of the darkness of ignorance into the light of knowledge.

To require of a physician to issue upon some unfortunate victim of a chronic disease a decree of banishment from home, from occupation, and often from family, without first providing him as judge with the requisite knowledge by which he can arrive at a right decision, savours of the injustice of demanding the making of bricks without straw.

I think that we, as a profession, do not sufficiently realise the tragedies that frequently occur in the lives and the fortunes of many invalids and their families whom we condemn to travel. Many an invalid is launched without adequate advice, and we find him drifting hither and thither on the sea of climates like a derelict, without guide or helm. The tragedy resulting from an ill-chosen operation, or from wrong treatment in an acute disease, is quickly over; but mistakes in chronic cases are often farther-reaching, and more lasting in their evil consequences, and none the less serious because more prolonged, and obscure. Enough time, thought, and knowledge is seldom bestowed, not alone on the subject of Climatology, and on the disease, but also on the individual himself and his tendencies and circumstances. Climatic change does not necessarily imply travelling afar. Change of climate, like charity, often begins at home, and occasionally may stop there; and whether at home or abroad, climate without hygiene is but a delusion and a snare, and climatology without facts is but as sounding brass and a tinkling cymbal.

Geographical and historical pathology, and the relation of weather to morbidity, as well as to mortality, is too little studied. An excel-

lent effort was made by the United States Weather Bureau to elucidate the latter subject by means of a publication in which weekly reports of sickness were gathered from physicians in all parts of the country, and arranged for comparison with the reports of the meteorological conditions prevailing at the same periods. Unfortunately, Congress has neglected to vote the funds necessary to carry on this good work. It is quite conceivable that in course of time, the accumulated experiences might have allowed warnings to be given to the invalid and he be thus guarded against the coming changes of the weather, as are the farmer and the mariner. Moreover, if the changes not only of the passing weather, but of special climates and seasons, were made more plain, much needless suffering to the sick, or disaster to the healthy, would be averted. If the dictum, " Salus populi suprema lex " be true, it follows that the protecting of the health of the people in this regard, is as much an obligation of the government as the saving of the people's wealth by land and sea.

Time does not permit a full discussion of what is known of the specific effects of the various meteorological factors or their combined effects in special climates, upon the development and progress of phthisis. Hermann Weber's " Climatotherapy," which was published as a volume of Ziemssen's System of Therapeutics, Hirsch's " Handbook of Historical and Geographical Pathology," Wilson Fox's Treatise on Diseases of the Lungs, and the Williams' works on Consumption and upon Aero-therapeutics, contain the chief and most valuable information upon this subject.

From these and other sources of knowledge, the following deductions appear reasonable ; speaking broadly, in their effects upon phthisis,

a. Cold is better than heat,

b. Dryness than dampness,

c. Sunshine than cloudiness,

d. High ground than low.

e. Wind in moderation is healthfully stimulating, unless it be damp, in which case it is depressing.

f. Variability of temperature with dryness is generally beneficial, and with dampness the reverse.

For most cases of phthisis the ideal condition of the atmosphere is one in which cool, dry air can be taken into the lungs while the surface of the body is pleasantly stimulated by the warmth and light of bright sunshine, and in which at night, the chamber-windows may safely be left open, so that the patient may breathe cold, dry air while sleeping under a warm cover.

The first essential of the air is plentifulness. For this reason it is better to be outside the house than inside. Within the air often changes too slowly.

The next essential quality of the air is purity.

Hirsch, in inquiring into the relative prevalence of phthisis in the different varieties of climates, collected a mass of evidence which showed clearly that phthisis was far less prevalent on high ground than on low; and this, irrespective of sanitary or of other conditions, although these conditions had certain modifying effects. While confessing his inability to account for this fact, he concludes that it is due to the more highly developed, and more active heart and vascular system. as well as to the better exercise of the respiratory function.

Since Hirsch wrote these opinions, much work has been done by numerous experimenters upon the blood-changes induced by altitude, and this research has demonstrated that the diminished barometric pressure and lessened oxygen tension existing in high altitudes, causes a marked increase of the red blood corpuscles, and of the hæmoglobin. It is, therefore, a fair inference that the resisting or germicidal power of the blood is thereby increased: so that the lodgment or development of tubercle bacilli is greatly hindered in high climates.

I have for some time been endeavouring to obtain the co-operation of the physiologists in settling this question, by their conducting a series of parallel experiments at sea level and at a high altitude, so as to ascertain the differences, if any, in the germicidal power of the blood in these extremes of climate.

I have lately been encouraged to believe that this will shortly be accomplished, and when this is done we shall at last be able to speak from actual knowledge and not only from inference.

In working upon my '*Handbook of Medical Climatology* I sought far and wide to obtain all the clinical evidence that has been published concerning the influence of the several varieties of climate upon phthisis. I collected in all about 9,000 cases, of which 7,995 allowed of tabulation, the remainder being too imperfect for that purpose, but their inclusion in the tables would not have altered the results obtained. A summary of each of these reports is given in the foot notes.

The various climates used were then grouped together under the following heads, namely :

Home Climates: These were the cases that remained in the country in which the disease developed, England being, however, the only country from which such records could be gathered.

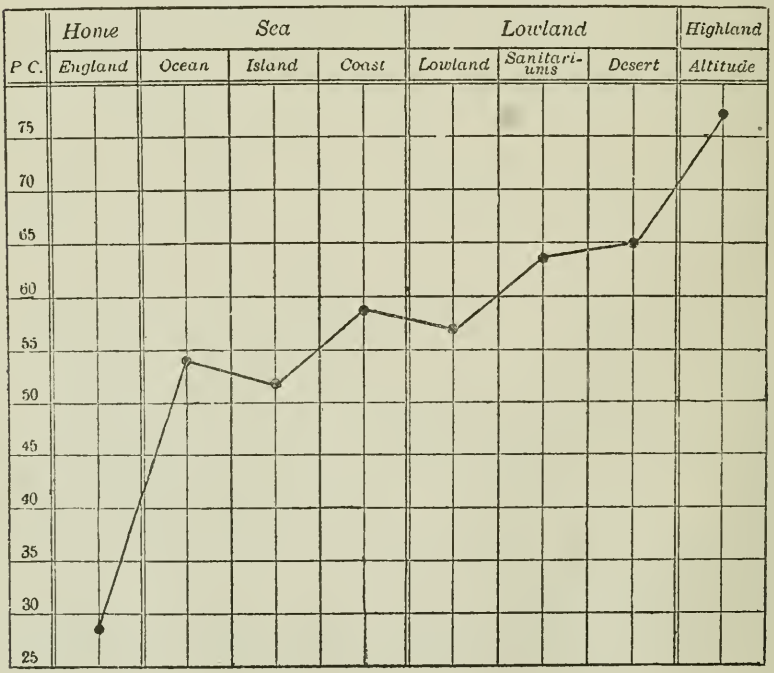
Sea Climates: Under which was placed the reports of cases that went on ocean voyages, or sojourned on ocean islands, or sea-coasts.

Low-land Climates: Inland, inland sanitariums,[1] and desert climates.

High Altitudes: The fourth group which was composed mainly of reports from the high Alps and Colorado.

The percentage of improvement of all the cases reported under these heads was obtained and the accompanying chart constructed and while the percentages may not be absolutely correct for all countries they probably represent the relative proportion of benefit derived from these several classes of climate. It was impossible to obtain a sufficiently broad comparison, and at the same time to divide the cases by the stage of the disease, or by the stated amount of benefit, on account of the lack of such information in many of the reports; so that this chart simply shows what proportion of all sorts of phthisical patients were influenced by residence in the various climates. In my book from which the chart is taken there are further analyses of the reports, but to-night, I wish merely to bring before you the broad results obtained from an analysis of all the clinical information at present available, concerning the comparative benefit conferred by the various classes of climates upon phthisis.

Analysis of 7795 Cases of Phthisis.



[1] These being reports of selected cases who had especial good care taken of them show a relatively higher percentage of improvement over the other cases residing in low-land places.

This chart very clearly demonstrates two facts: That, as a general principle, the phthisical improve the further they remove from the sea towards the interior of the continent, as shown in the chart by the ascending scale of benefit in proceeding from the ocean to the desert; thus proving that dryness is better than dampness. While the still greater percentage of improvement exhibited in the high climates, even over the dry climates of the desert, proves the second fact, viz.: That diminished barometric pressure is even more powerful than dryness in arresting the progress of phthisis. So it may be said that while desert air is good, mountain air is better.

There are, of course, many exceptions, to the rules laid down; because tuberculosis in man is not like that produced by a laboratory experiment, in which tuberculous matter is injected into a healthy animal whose vital resistance is as yet unimpaired. For it is probable that the absorption of tuberculous material by man very rarely takes place unless there is some lesion of the respiratory or digestive tract; and that it very seldom spreads beyond the point of entrance, or results in phthisis, unless there is a lowered vitality, or a peculiar vulnerability of the tissues in the individual affected. From this it follows, that in choosing the climatic remedy for a case of phthisis, we must take into consideration not only the tuberculosis, but the preceding condition of ill health, and the peculiarities of the individual. While these conditions exist in varying degrees in almost all phthisical patients, yet, as factors in the onward march of the disease, especially in its earlier stages, they are often of very different importance.

For these reasons, I have found in endeavouring to distinguish between the forms of phthisis suitable for climatic treatment that it is most satisfactory to group them as tuberculous, catarrhal and pneumonic, remembering, of course, that all are tuberculous and usually catarrhal.

The first or tubercular group, would embrace those in whom the tuberculosis pure and simple appears to overshadow the other conditions and they are usually those with the vulnerability of tissue referred to, who have a congenital and perhaps an hereditary predisposition towards tuberculosis and phthisis. In such cases anæmia and imperfect development of the heart and lungs is common.

The second group, catarrhal, consists of cases who are subject to frequent catarrhs and whose history shows tuberculosis following a catarrhal attack, and in whom exacerbations usually appear preceded by recurrent cold-catching. These are generally cases in which more or less obstruction of the upper passages exists and in which attacks of bronchitis are frequent. They are usually persons of feeble reac-

tion, who, therefore, are apt to develop chronic congestions rather than inflammations.

The third group, the pneumonic, includes those patients whose tuberculosis is usually preceded by an inflammatory process, and in whom the disease advances by leaps and bounds, following recurrent pneumonias, the intervals being often marked by improvement which it may be decided is generally only temporary. These patients are of the erethistic type, and are peculiarly subject to high fevers and great nervous irritability.

In thus seeking to distinguish the chief differences in phthisical cases, it must not be forgotten that the type sometimes varies with the stage of the disease, and a climate which has been most beneficial at one period is not so at another; moreover, even when the patient is in the climate best suited for his prolonged residence, yet, mere change of air is occasionally necessary for chronic invalids as much as for well people.

It may be said as a general rule that cases of phthisis, especially the tuberculous type, do best in high climates, more particularly in those in which, while there is an abundance of sunshine, the air is cold and dry.

The catarrhal form is also usually benefited by a high climate, but such cases do best where the air is warm and dry, and in winter especially where the elevation is not extreme.

The pneumonic cases are usually best suited to a climate very moderately elevated, in which the air is warm and comparatively moist.

The chief contra-indications to the use of high climates are disease of the heart without good compensation, arterio-sclerosis, a limited area of healthy lung, advanced fibrosis, marked erethistic tendencies, and old age. A weak cardiac muscle present in the young is not necessarily a bar to the use of a high altitude; on the contrary, if the patient is put on a more or less complete rest-cure for the first few weeks of his residence, his heart will usually be permanently strengthened, but after middle life such a condition is apt to be made worse by change to an elevated climate.

To conclude with a brief consideration of what cases of phthisis are suitable for climatic change, I shall quote the following epitome from my article upon tuberculosis, in the last volume of Hare's System of Therapeutics: "In order to lay down a rational and systematic plan of treatment the tuberculous individual and his circumstances must be duly considered as well as the type and stage of his disease. This is especially true when the matter of change of climate is under consideration. There are many patients to whom, on account of their circumstances, leaving home is a real hardship, and these should not

be forced to do so unless home treatment is not succeeding. Of such cases those in which the disease has arisen under peculiarily unfavourable conditions of life may often be safely allowed to remain for a time, at least, until the tendencies of the case are clearly indicated, if such conditions can be removed and the environment made hygienic. Some of those in whom the tuberculosis is not advanced or active and whose ill health appears to be due not so much to this infection as to indigestion or other cause which can be treated at home, may remain if they are carefully watched. Occasionally a change of house, soil, or conditions physical or social, will put the patient on the road to recovery if the accompanying treatment is judicious. Hereditary cases should always be sent away, and as a rule the change must be permanent. Cases resulting from pneumonia, pleurisy, or bronchial catarrh, which are slow in clearing up should have climatic change, and, where the patient can afford it and domestic ties do not interfere, it is always safer to advise an appropriate change. In doing this the habits and requirements of the patient must be considered, as well as the climate of the resort to which he is to be sent. Before selecting a climate the physician should first acquaint himself with the principles of medical climatology as well as with the details of the resorts.

SUCCESSFUL REMOVAL OF AN ENORMOUS MESENTERIC TUMOUR AND NEARLY EIGHT FEET OF INTESTINE.

BY

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The successful cases of removal of large sections of intestine are by no means uncommon; in 1881 Koeberlé, of Strassburg, removed six and a half feet successfully, and this amount has not been often exceeded since that time. When in addition to intestine a large tumour also has to be removed, the condition becomes more complicated, and the number of cases of resection of a large extent of gut with a tumour are not very numerous. My case is as follows:

C. S., aged 28, a healthy looking young man, with a florid complexion, was sent to me January 18th, by Dr. H. A. Lafleur, for opinion as to advisability of operation. On examination, the patient's abdomen appeared very prominent, and, on palpating it was seen that a smooth hard tumour filled the whole abdomen from the ensiform cartilage to the pubes. It was quite movable, and its upper edge immediately below the ribs could be felt sharp and hard. Over the anterior part of the abdomen percussion was dull, but in the flanks a resonant note was easily elicited. One got the impression from examination that the tumour was a solid one. Patient did not complain of pain, and said he had never had any; he had never been ill. A year ago noticed that his dress clothes, which he only occasionally wore, seemed too small for him, and he thought it was because he was growing stout. Three or four months ago remarked that his abdomen was swollen, and on feeling it noticed a tumour which was quite movable. The tumour had gradually grown to its present size. Bowels have always been most regular; urine has always been normal. On consultation, operation was advised. The tumour was thought to be probably a retro-peritoneal lipoma on account of its size, smoothness, and gradual growth. Dr. Armstrong, who saw the case with me and assisted at the operation, agreed as to necessity of operation.

Operation, January 18th, 1897.—The patient having been etherised, an incision was made into the abdominal cavity above the umbilicus and the tumour was immediately reached. It had a bluish look, seemed elastic, and apparently free from adhesions. The incision was enlarged upwards, and on introducing my hand, I found a perfectly smooth tumour unattached above and, as far as I could reach, on the flanks, but having many adhesions below and in front.

The tumour filled the whole cavity of the abdomen, and the sides overlapped so much that it could not be explored postero-laterally or posteriorly. Removal was thought feasible, so the incision was extended for some distance below the umbilicus. There were firm adhesions both over the anterior and lateral surfaces of the growth. After separating these rapidly, with some hæmorrhage, the tumour was quickly delivered from the abdomen, and then it became plain that it grew from the mesentery, and had some three feet of small intestine closely adherent to it on its lower and posterior aspect. Above, the tumour was closely attached to the transverse colon. Beneath the colic attachment a great number of large mesenteric vessels entered it. It was now seen that at least 3 feet of intestine would have to be removed, and perhaps more, owing to ligature of mesenteric vessels, would be

deprived of nutrition, and removal would be necessary. There was nothing to do but to go on with the operation, for, certainly, the tumour could not be returned The tumour seemed so intimately blended with its covering of mesentery, that, owing to excessive hæmorrhage which resulted from the attempt, enucleation had to be abandoned. First, the transverse colon was separated from the upper end of the tumour to which it was attached by fibrous tissue; then the mesenteric vessels were ligatured one by one, as close to the tumour as possible, and the mesentery cut as tied. After some time and the tying of numberless ligatures, the tumour was freed, the intestines involved in its lower part cut away, and the mass with the 3 feet of ileum lifted out of the abdomen. Previously to cutting away the bowel which was attached to the tumour, rubber tubing was tied around it. Now, after removing the tumour, two ends of bowel remained, each end having over 2 feet absolutely without any mesenteric blood supply. There was nothing to be done but to remove these portions of bowel. The ends were brought together in the way I usually adopt in resection, namely, a continuous suture of fine silk through the mucous membrane and afterwards a continuous Lembert suture through the peritoneum and subperitoneal tissue. Afterwards the rent in the mesentery was closed with continuous Lembert sutures. During the time these procedures were being carried out, the patient had been getting very weak from loss of blood, and the long continuance of the operation, so, whilst I was suturing the bowel my assistants introduced into the basilic vein of right arm two quarts of sterilised saline solution, which had the effect of bringing up the pulse very satisfactorily. In fact, without this aid, I do not believe the patient would have left the table alive. On examining the bowel it was found that the lower end, after the removal of the portion deprived of its blood supply, was only about six inches from the ileo-cæcal valve, and that all the portion removed was ileum.

After swabbing out the abdomen, which now seemed to have little intestine in it, and clearing the pelvis of blood clots, some large pieces of gauze were packed about the pedicle of the tumour into the flanks and into the pelvis, and the ends brought out of the wound. The abdomen was now closed with silkworm gut sutures, and the usual dressings applied. On leaving the table the patient's pulse was 160, and hardly perceptible at the wrist.

After a few hours in a warm bed, it fell to 120. The actual operation took nearly an hour and a half, the greatest time being consumed in ligaturing and cutting away the mesentery. During the night following the operation, nutritive and stimulating enemata were given; he vomited a few times only. Next day he complained of severe pain and a sense of tightness, but was in very good condition, with a pulse of 112, temperature 100°. That night he was given $\frac{1}{4}$ gr. sulphate of morphine hypodermically, and he slept well all night. Next morning he was given a large enema of soap-suds and turpentine, but it was ineffectual, and was followed by some vomiting. There was of course, no distention, so much bowel and so large a tumour having been taken away. The gauzes were removed from the abdomen, and on the second day the wound was redressed; temperature 100°, pulse 120.

On the night of the third day an enema brought away considerable flatus. Still fed by enemata, and given cracked ice and champagne by the mouth. At night he was given $\frac{1}{3}$ gr. sulphate of morphine hypodermically, and slept well.

On the fourth day he vomited occasionally, and had a very dry tongue; was restless, but his pulse improved (96), and temperature reached normal.

On the fifth day beef-tea, milk, and lime water were given by the mouth.

On the sixth day he first had a stool, and after this there was rather an inclination to diarrhœa. The wound was dressed for the second time on the eighth day January 26th), and the stitches were removed. There was a stitch-hole abscess of considerable size at the lower end of the wound, which discharged pus for a few days, but there was no rise of temperature.

During convalescence his temperature ranged from 98-99°, and pulse 90-100.

On February 18th he was so well that he went out for a drive, and he left the hospital on February 21st, about five weeks after the operation.

During the last two weeks of his stay in the hospital he gained flesh rapidly, his weight increasing during one week a pound a day, altogether 15 pounds.

I heard from him a month ago (July, 1897), and he writes that he feels perfectly well, and rides a bicycle and weighs 140 pounds. When he left Montreal in March he weighed 115 pounds.

After leaving the hospital he had frequent attacks of diarrhœa—in fact, seldom had a solid stool. He would swell up for a day or two, and then be relieved by a large number of liquid stools; in the interval his stools were always liquid, and he suffered from occasional attacks of colic.

After the operation we were in some doubt as to whether the patient would obtain sufficient nutrition from the intestine that was left, for after the 8 feet were taken away the amount of small intestine seemed very small, being unusually short in his case; however when he began to eat he rapidly gained weight, and has continued to do so up to the present. At the time, I was consoled by reading some experiments of Senn on dogs, in which he concluded, that in all cases of extensive resection of small intestines where the resected portion exceed one-half the length of this portion of the intestinal tract; where the animal survived the operation marasmus followed as a constant result, although the animals consumed large quantities of food. In all these cases defective digestion and absorption could be directly attributed to a degree of shortening of the digestive canal incompatible with normal digestion and absorption. As the small intestines usually measure from 20 to 22 feet, and as only about 8 feet had been removed, I felt there was reason for anticipating a favourable termination of the operation. Gzebicky concludes, after many experiments on animals, that a resection of 286 centimetres in man is feasible.[1] In my case 234 were removed, and in one case, a boy, operated on by Ruggi, of Rome, 3 metres and 30 centimetres were removed; the patient recovered. This is the greatest amount of intestine that, as far as I am aware, was ever successfully resected.

The question of solid mesenteric tumours has been recently dealt with by W. L. Harris and W. Herzog,[2] of Chicago, who report a successful case of removal of a solid mesenteric tumour (weighing 5 lbs.) and 51 centimetres of intestines from a boy aged 5 years. A table is given of 57 cases. Of these 18 were operated on, and 10 recovered from the operation. Of these 10 cases only 2 were malignant tumours, and 1 died subsequently from obstruction due to a Murphy's button. In the majority of cases nothing was done, and they all died.

Of the 57 cases death was reported in 40 cases. No data given in 7 cases. Recovered after operation 10 cases.

Of these 57 cases 16 were carcinomata, 10 lipomata, ard 7 sarcomata; the rest were fibromata and lymphomata, etc.

A minute account is given of the microscopical appearance of the

tumour in the case of Dr. Harris and Herzog, which proved to be lympho-sarcoma. The case was diagnosed as one of tumour of the mesentery before operation.

In only 3 cases of these operations for tumours of the mesentery is there any mention of removal of intestine. In case 30, Madeling removed 20 centimetres of gut ; in case 53, Canthorn removed 43 inches (about 109 centimetres) ; and in case 57, Harris removed 51 centimetres (20 inches).

In a paper by Dr. J. W. Elliot, of Boston " On the Operative Relief of Gangrene of Intestine due to Occlusion of the Mesenteric Vessels,"[3] a number of cases where more extensive resection of the gut than in his own was successfully accomplished is given. These are five in number, namely those of Kocher, Koeberlé, Schlange, and Braum ; to these I can add as many more.

No.	Operator.	Amount Resected.		For What.
		m.	c.m.	
1	Ruggi	3	30	Stricture and inflammatory matting of intestines.
2	Shepherd	2	34	Tumour of mesentery.
3	Kocher	2	8	Railway injury.
4	Koeberlé	2	3	Multiple strictures.
5	Kocher	1	60	Strangulated hernia.
6	Braun	1	37	Umbilical hernia.
7	Schlange	1	35	Internal strangulation.
8	Elliot.....	1	24	Gangrene of intestine.
9	Roux.....	1	24	Lipoma of mesentery.
10	Canthorn.....	1	9	Sarcoma of mesentery.
11	Maston, G. W..	1	12	Sarcoma of mesentery.
12	Trombetta.....	1	10	——
13	Hahn.....		80	Quoted by Ruggi.

In these thirteen cases the patients all recovered from the operation, and six months later eight were in good health, one died four months after from marasmus, and two from obstruction due to a Murphy's button. In the others the loss of so large an amount of small intestine did not apparently interfere with their nutrition, except in Braun's case (6). Diarrhœa was noticed in several cases, especially where careful dieting was not observed. Otherwise patients felt well, and most of them had continued to gain flesh, my own case during the last three months gained 25 lbs.

The following is a more detailed account of the cases tabulated above :

1. The most remarkable case is that Ruggi.[4] In this case 330 centimetres of small gut were removed in 1894, from a boy, aged 8, for stenosis. Three operations were performed. The first relieved the stenosis by dividing a band ; obstruction continuing, 7 to 8 centimetres were resected. This relieved for a time, when again obstruction occurred and a third operation was performed. The obstruction

this time was found to be due to matting together of coils of intestine, and in endeavouring to free them the mesentery was torn away ; so a large amount of bowel had to be removed, namely, 3m. 30cm. The ends were brought together by primary suture. The boy did well, all his digestive functions being satisfactorily performed. He gained flesh after some weeks rapidly, and was in perfect health two years after when the article was written. This, as far as I know, is the largest piece of intestine successfully resected.

2. Shepherd 92 inches (2 m. 34 cm.) of small gut measured without stretching the day after operation and reported above. In this case a solid tumour, weighing 13 lbs., was also removed. Patient well seven months afterwards and gaining flesh.

5. Kocher[5] 2 m. 8 cm. removed for railway injury. Ends of intestine united by primary suture. Patient remained well, with the exception of having a diarrhœa easily started by errors of diet.

4. Koeberlé,[6] of Strassburg, resected 2 m. 3 cm. (6 feet $1\frac{1}{4}$ inches) for multiple strictures. The cut ends were stitched into the abdominal wound which wound closed in 6 weeks, and the patient, a woman aged 22, suffered no digestive troubles after.

5. Kocher[7] resected 160 cm. (5 feet 3 inches) for strangulated hernia in a man aged 57 by primary suture. Patient died three years later from another disease.

6. Braun[8] removed 137 cm. (4 feet 6 inches) by immediate suture for umbilical hernia. Patient died four months later of inanition after a second operation.

7. Schlange[9] resected 135 cm. (4 feet 5 inches) for internal strangulation in a woman aged 42. Two years later patient was in good health.

8. Elliot[10] resected 124 cm. (4 feet $\frac{3}{4}$ inch) in a man aged 25 for infarction due to thrombosis of the mesenteric veins. Patient was in good health two years after.

9. Roux,[11] of Marseilles, resected 124 cm. of intestine (4 feet $\frac{3}{4}$ inch) for a lipoma, with recovery.

10. Canthorn[12] resected 43 inches (109 cm.) of small intestines from a man aged 49 for sarcoma of mesentery, ends united by Murphy's button, Patient recovered from operation, but died four months later from obstruction brought about by the button.

11. Maston[13] resected 112 cm. (44 inches) for sarcoma of mesentery, death five months later from perforation due to Murphy's button.

12. Trombetta in 1884 resected 110 centimetres ($43\frac{1}{2}$ inches) of small intestines in a women, aged 40 years (quoted by Ruggi).

13. Hahn resected 80 centimetres (31½ inches), 1885, in a man aged 38 years (quoted by Ruggi).

The following is the pathological report of tumour in my case furnished by Dr. Wyatt Johnston, pathologist to the hospital :

Large, smooth, firm rounded growth, 11 inches by 10 inches by 5 inches. Weight 5,250 grames (13 lbs.). Attached to the growth are 36 inches of small intestine. Also two other lengths of small intestine received, 30 inches and 26 inches respeetively. Total length of gut removed 7 feet 8 inches (234 cm.),

Growth encapsulated, firm, inelastic to touch. On section cut surface, pale grey, translucent and glistening; not very vascular; has a fasciculated appearance.

Microscopical examination shows growth to be fibromyxoma containing clear spaces, which contain a fluid becoming coagulated and granular on adding acetic acid. Stained sections show spindle and stellate cells, forming bundles and reticulæ. Vessels are much thickened. These growths are semi-malignant, but prognosis better than in sarcoma.

[The patient was exhibited to the Section as well as the tumour and the three lengths of intestine which had been removed. Patient was in perfect health and said now he had normal stools.]

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DISLOCATION OF THE KIDNEY.

BY

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Dislocation of the kidney should be distinguished from movable and misplaced kidney. Dislocation of the kidney, as I understand it, is a rare affection, and is one that is difficult to diagnose. It is easy for us to criticise our apparently blinded perception when looking back upon a case that has passed through the different stages of examination and exploratory operation.

I was called some time ago to see a lady in consultation with one of our leading physicians. The patient herself was the wife of a physician who had been many years in practice. She was 53 years of age. had been married for several years, and given birth to several children, While at an entertainment on the evening of October 23rd, 1896, she was attacked with a severe pain in the right hypochondrium. She found it necessary to leave the hall, and arrived at a friend's house in about an hour. When seen, she was suffering intensely and vomiting at intervals. Examination revealed a small tumour in the abdomen situated about the point of the tenth rib, and apparently about the size of a walnut. It seemed to be attached to the liver, and moved with respiration. She complained of a dragging sensation in the region of the right kidney and a frequent desire to urinate. The tumour was not sensitive to pressure, but when pressure was made from without inwards more distress was caused than when it was pressed from within outwards.

The history of the case showed that the patient had been subject to similar attacks for twelve or thirteen years. During each attack the pain was situated in the right hypochondriac region, was accompanied by a similar dragging sensation and similar frequent desire to urinate, and occasionally with chills, fever, and vomiting. Each attack was preceded by an uneasy sensation, and by this the patient was apparently warned of impending trouble. She soon learned that on assuming the recumbent posture the pain would almost instantly vanish, and not return perhaps for days. At a later stage of the complaint the pain would not leave until after vomiting occurred. It was some time after this period that a small tumour was discovered that disappeared on pressure with a gurgling sensation, followed by sudden and complete relief of the pain.

Several physicians living in her neighbourhood saw her, examined

the tumour when down, felt the gurgling when it receded, and were of the opinion that it was a rare form of ventral hernia. About ten years ago pus was found in the urine in microscopical quantities at varying intervals, and this was supposed to be due to pyelitis.

Just prior to the last attack incipient cataracts had been discovered in both eyes. As a general rule, the tumour would vanish easily on pressure. Often when riding in a carriage the patient would lean forward, press on the tumour, and reduce it. When attacked at home she would lie down, press the tumour back, and immediately resume her duties. If, however, from any cause the tumour was allowed to remain down for any length of time, it would then be very difficult to reduce it, and its reduction would be followed by chills and fever and sometimes by night sweats continuing during several nights. These attacks would sometimes come on almost every day when the patient was in otherwise perfect health, or an interval might occur of many weeks without the occurrence of an attack. Her husband thinks that she must have had at least 1,000 of these attacks, severe and light.

During the last seizure, when I saw her, the tumour remained irreducible; the pain was very severe, and vomiting occurred frequently. After about twenty-four hours she began to have chills and fever at times; the temperature rose to 104°; the patient looked very ill. No positive diagnosis could be made; the general opinion was that she was suffering from some obstruction of the cystic duct of the gall bladder. Exploratory operation was advised and refused, but in a few days the patient asked for operation. After six days and nights of great suffering the operation was performed.

The abdomen was opened over the situation of the gall bladder, which was found to be normal; the gall bladder itself was pressed forwards, was empty, and the mass felt before operation was found to be the right kidney pushed up under the ribs, displacing the lower portion of the liver. This was cystic and the kidney was cystic, the cyst communicating freely with the pelvis of the organ and containing 7 ounces of urine. This was evacuated, a drainage tube inserted, and the opening in the kidney stitched to the wound in the abdomen. Iodoform gauze was packed around to prevent extravasation of urine into the abdominal cavity. She made a good recovery, and went home four weeks after the operation.

For six weeks there was no return of the trouble, but in two or three days after getting up the kidney became distended again, could be felt distinctly through the abdominal walls, and she suffered from pain. After that time she had two slight attacks at intervals of about two weeks. When last heard of there had been no attack for eleven weeks. There is still some pus in the urine.

At the time of the operation I would have preferred nephrectomy to nephrotomy, but this was refused by the friends, and it is scarcely probable that the patient would have survived it. The case is in my experience a unique one, and there are several points that deserve consideration.

From the sudden onset of the pain, the vomiting, and the appearance of the tumour, three conditions were taken into consideration, namely, stone in the cystic duct and sudden enlargement of the gall bladder, some rare form of hernia of intestine, or dislocated kidney. The patient herself was suffering from a very severe form of angular curvature of the spine, producing great prominence of the lumbar vertebræ, so that they crowded the intestines into the loins and away from the median line. The edge of the costal cartilages was, as a consequence, approximated to the anterior protrusion of the spine, and through this opening the kidney slipped. A movable kidney is frequently caught in this position when the patient stoops down even when there is no deformity of the spine. The deformity of the spine in this case, I considered, accounted for the aggravation of the symtoms.

The patient, in her last severe attack before operation, frequently said that if she could put the tumour back as she had put it back a hundred times before she would be all right. But, for the first time, she failed to reduce the dislocation. On previous occasions she had been able to press back the tumour by assuming the recumbent posture.

The gurgling sensation described was unaccounted for. No cause was found in the cystic mass. The gurgling led to the belief that perhaps the enlargement was due to a partial strangulation of a knuckle of intestine. Her husband, though a well informed and experienced practitioner, was unable to throw any light upon the case, and was as much in the dark as any of us. No one ever thought that the tumour could be in reality a dislocated kidney. The presence of minute quantities of pus in the urine should have excited some suspicion as to the true nature of the case.

Hydronephrosis and movable kidney are closely associated with one another. Pyonephrosis is very liable to follow in the wake of hydronephrosis. The diagnosis in this case of temporary distention of the kidney is not easy.

At one examination during the attack of pain the enlarged, rounded, tense kidney, could be felt, and in twenty-four hours no tumour could be made out even after the most careful examination. The urine has escaped, and nothing but a collapsed sac remains.

In a case recently operated on I found the patient at my first visit in the first condition—namely, with the kidney distended. There

had been some little dispute as to the correctness of my diagnosis, and as there were several physicians in the patient's family I hesitated before making the first incision owing to the fact that no tumour could be discovered. The hesitation was but mometary ; the incision was made, a collapsed kidney drawn into the wound and tapped, and a small quantity of urine slightly tinged with pus removed. Misplacement of the kidney did not tend to disorganise the organ to the same extent that dislocations do.

Recently I operated on a young girl, aged 15. She was brought to me suffering from abdominal pains, and during the examination I discovered a tumour that centred on the spine, with its lower edge on a level with the umbilicus. It was flattened from before backwards, irregular in its outline, and but slightly movable. I advised exploratory operation.

After the abdomen was opened the mass was found lying in front of the spine and behind the posterior layer of the parietal peritoneum. The lobulation of the mass was peculiar. It looked like a kidney without a confining capsule, and was not kidney shaped. Its colour and other appearances soon proved, however, that it was a congenitally misplaced, malformed, but otherwise healthy-looking kidney. The right kidney was absent from its normal position. I was pleased to find that there was nothing more serious the matter with the patient. She has since remained in perfect health. She states that she is unable to lean her abdomen against any hard substance, such as the table, without feeling pain and nausea.

For a time it was thought that misplacement of the kidney produced but little damage to the renal structure. Renal structure, is, however, very susceptible to the effects of the damming back of the urine, as is evidenced by the results produced after the continuance of stricture of the urethra from any cause. But the kidney seems very prone to become cystic under such circumstances. As the ureter is collapsible, a slight movement of the kidney may produce a condition akin to the stricture. This kinking of the ureter cannot be produced in any but a minority of the cases of movable kidney. If this were not so we would meet with degeneration, such as that described, much more frequently than we do. If the operation of nephrorrhaphy can be relied upon to keep the kidney *in situ*, and if the operation can be performed without the placing of any permanent sutures that are liable to produce renal irritation, then it is certainly indicated in every case of movable kidney in order that a subsequent degeneration may be prevented. But the harmlessness and the success of the operation have not yet been satisfactorily demonstrated.

POST-OPERATIVE ACUTE ILLNESS FROM AN UNEXPECTED CAUSE.

BY

C. M. B. Cornell, Brockville, Ont.

On Saturday, Mrs. —, æt. 43, was submitted to operation for restoration of the integrity and function of the sphincter ani muscle, complete laceration of which she sustained at her first and only labour nine years before. The procedure was accomplished by means of the flap-splitting method.

There was no manifestation of wound or systemic disturbance on Sunday. On Monday morning there were chilly sensations, malaise, rapid pulse and elevated temperature. In the afternoon the pulse was 140, the temperature 104° F. Inspection of the wound revealed no evidence of departure from the course observed in favourable cases, nor did the patient volunteer any expression, indicating local discomfort. The tonsils were noted to be slightly reddened, with a sense of mild irritation in the throat, but no distinct soreness or dysphagia. My anxiety reached the degree of great mental discomfort. The operation had been done in a private house, but a careful review of the preparation of the patient and every thing and every person connected with the operation, including the several stages of the latter and the subsequent management, betrayed no circumstance or condition in which we thought ourselves culpable. Yet my impression was that the phenomena undeniably pointed to sepsis as the disturbing factor.

Evening brought no relief to patient, nurse, or surgeon, and I was about to remove the sutures, open up the denuded surfaces and treat the condition as an infected wound, when circumstances not in themselves insuperable, but fortunately deterrent, influenced me to defer the matter until morning. All night the patient was ill, but made no complaint of the wound, the bowels having moved without injury to the mended muscle.

Tuesday morning showed no abatement in the rapidity of the pulse, nor had the temperature markedly fallen. My patient did not by statement or appearance conceal the fact that she was decidedly ill. However, relief came more speedily to me than to her, for inspection of the trunk and extremities demonstrated the characteristic efflorescence of scarlatina. Investigation showed unquestionable exposure eight days before the declaration of the attack of scarlatina.

The acute illness in no way interfered with the favourable progress of the wound, removal of the sutures showing primary union of the flaps and an intact sphincter ani muscle.

The scarlatina called for no vigorous treatment.

Hospital Reports.

BY

Norreys Worthington, M.D., Sherbrooke.

Case I. *Cancer of Stomach.* Mrs. E. P., aged 59, widow, of East Sherbrooke, was admitted to the Sherbrooke Protestant Hospital Oct. 14th, complaining of great pain in the epigastrium and vomiting after eating. She had been under treatment for some five or six weeks for malignant disease of the stomach, but was unable to enter the hospital before. She had a slight patch of lupus on the side of the nose, also mitral disease. A hard nodular mass was plainly visible above and to the left of the umbilicus, very movable and tender on palpation.

On Oct. 18th an exploratory incision was made in the median line, when the stomach was found somewhat dilated, and the mass involving more than one-third of the organ, principally the upper anterior and posterior surfaces, from the middle of the lesser curvature to the duodenum.

The feasibility of removing the growth having been discussed and decided upon, the stomach was withdrawn and half a dozen silk-worm sutures passed under the growth to facilitate removal and prevent the escape of contents into the abdominal cavity, which was protected by sterilised gauze. The growth was then excised with scissors, the incision running longitudinally as much as possible and the continuity of the stomach and duodenum continued only by about two inches of the lower border of that organ and the bowel. The edges of the incision were brought together transversely to preserve as much as possible the lumen of the organ and increase its capacity. The mucous membrane was stitched with a continuous catgut suture, the muscular and serous coats with a continuous suture of fine silk, these two rows of sutures invaginated and another continuous Lembert suture passed through the serous coat. A small piece of the lesser omentum and of the peritoneum, supporting the stomach to the diaphragm, were found to be involved and removed, the only hæmorrhage of any importance being from this peritoneal support.

Although the patient bore the operation remarkably well, a quantity of saline solution was poured into the abdominal cavity and allowed to remain.

The wound closed by primary union and the patient made an exceptionally favourable recovery.

There was very little vomiting after the anæsthetic, what there was being dark and bloody.

Enemata of brandy and bovinine, of each half an ounce diluted, were given every two hours for the first six hours, after which bovinine and peptonized milk were given in larger quantities at longer intervals.

On the 21st, three days after the operation, small quantities of peptonized milk were allowed by the mouth, and not causing any discomfort, were gradually increased after some days to six ounces every four hours, and at the expiration of two weeks she was sitting up in bed and taking bread and milk, custard and soft eggs.

The bowels were not moved for 6 or 7 days with the exception of two slight dark bloody stools the day following the operation. On the 25th natural movements began. There was very little rise of temperature or acceleration of the pulse throughout, and patient left the hospital, Nov. 8th, after having been up and about the ward for several days and entirely free from pain.

Case II. *Angio-Sarcoma of Ovary.*—Addie B., aged 17, of Newport, Vermont, admitted to hospital, Sept. 20th. I saw her first Sept. 8th, and found her suffering great pain in the left iliac region and back, which was readily relieved by a hypodermic of morphia.

She was extremely anæmic. Temp. 99½ ; pulse, 120.

The abdomen was quite flat except for a slight fulness above the crest of the left ilium. Over this there was slight dulness and pain on pressure. Had only menstruated twice, the last time being four months previous. Had passed portions of tape worm six months before, and had been an invalid for some time.

She continued much in this condition for a week with pain and vomiting, but no further enlargement of abdomen, but on Sept. 13th, a distinct enlargement could be felt in the left iliac region. This increased with such rapidity that an immediate operation was urged but refused.

By Sept. 18th it had assumed such proportions as to fill the pelvis and extend nearly to the umbilicus. She was then removed to the hospital in a very low condition (temp. 102° ; pulse, 150 ; vomiting), and operated on shortly after admission. On opening the abdomen a quantity of dark bloody fluid escaped, which was found coming from a bluish tumour, the size of a large cocoanut, which protruded from the left side of the abdomen.

Its surface was covered with large cysts, many of which ruptured immediately the abdominal support was removed by the incision. The tumour was found to be the left ovary greatly enlarged and the

pedicle twisted. This was ligatured and easily removed there being no adhesions.

The patient made a very satisfactory recovery until the tenth day, when phlebitis set in, affecting first the leg on the side of the growth, and when that subsided, the other leg. During her rest in bed she improved rapidly with iron and arsenic, and on leaving the hospital, six weeks from date of operation, had lost her anæmic look.

Diagnosis by Dr. Wyatt Johnston as follows : " Angio-sarcoma, newly formed capillary vessels being abundant. Does not appear to be highly malignant."

The extreme rapidity of the growth can perhaps be attributed to a sudden jump out of bed in a state of alarm, the day of the onset of pain, this causing strangulation of the pedicle. In both operations I had the able advice and assistance of Drs. Austin, Smith and Farwell.

In reporting these two cases I do so principally on account of the successful termination of the first, and the extreme rapidity of growth in the second.

RETROSPECT

OF

CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Affections of the Liver, Complicating Typhoid Fever,

OSLER. "Hepatic complications of typhoid fever."—*Transactions of the Association of American Physicians,* Vol. 12, 1897.

DAURIAC. "Des infections biliaires dans la fièvre typhoide."—*Gazette Hebd. de Médecine et de Chirurgie,* Paris, July 25th, 1897, No. 59.

MASON. "Gall-bladder infection in typhoid fever."—*Transactions of the Association of American Physicians,* Vol. 12, 1897.

HUNTER. "A discussion on cholelithiasis."—*British Medical Journal,* Oct. 30th, 1897.

It falls to the lot of very few physicians to meet with cases of typhoid fever complicated by diseases of the liver or bile ducts. Such a combination indeed is peculiarly rare, a fact which is all the more remarkable when one considers how intimately associated are the intestines and liver. The ulcers in typhoid fever were liable, one would think, to infect the portal system, and through this the bile ducts. However, a careful perusal of the literature of the past five or six decades shows comparatively few cases where such complications have occurred, and, what is likewise remarkable, most of these were recorded more than 20 years ago.

What applies to this condition applies equally well to the vast majority of the morbid lesions occurring in disease, and which have for the most part been observed and recorded with astonishing precision by the authorities whose names belong to several generations ago.

It is just such facts as these that have so interesting a significance in connection with the value of morbid anatomy as a progressive science; for the more assiduously the pathologist investigates diseased

tissue, the more does he realise how few are the new discoveries here made of recent years and how great therefore are the limitations in that department. Text-books written more than 10 years ago, such as those of Orth and Ziegler, cannot but fail to satisfy the most eager student, and the paltry additions made in more recent works on the subject by so many authors scarcely justify their publication. The future for pathological research, indeed, would seem to rest far more on the lines of study indicated by *processes of disease* than by the minute study of the diseased tissues themselves. One must, however, make a distinct exception in the case of the nervous system where the most recent methods of technique have produced astonishing and most satisfactory results.

Whatever has been learned within the past few years concerning the hepatic complications of typhoid fever has certainly not been along the lines of morbid anatomy ; it is the study of bacteriology which has added the most important information and rendered valuable service, both in the diagnosis and in the treatment of all such affections. The literature on this interesting subject of typhoidal infection of the liver is, too, peculiarly interesting, as indicating the almost inestimable value of the early observations of such great men as Murchison, Hagenmuller, Louis and others. The great boon to the medical world resulting from their careful observations and painstaking collection of facts has been strikingly set forth in Dr. Osler's recent delightful pamphlet upon the influence of Louis upon American medicine ; of interest here chiefly in connection with the great work which that authority has done in his researches on typhoid fever.

Considering briefly the *means* whereby a typhoidal infection of the liver or bile ducts occurs, one may safely ascribe the invasion as proceeding through one of two paths, either descending or ascending, the former by means of veins carrying the infection from the intestinal ulcers, the other more directly by ascension from the duodenum into the bile ducts. There are numerous factors of assistance to the bacteria in this last means of progression, most notably the active motility of the organism itself, the quality of the bile as a culture medium, and the comparative stagnation of the stream of bile, a condition especially induced in this disease. It need scarcely be added that anything tending to injure the liver tissue itself, such as the existence of previous disease, the presence of calculi and so on, will materially further such an infection.

Results of infection.—The *results* of such an infection can be of the most varied character. The numerous observations recently made by Chiari and others upon the frequent occurrence of bacilli in the gall-

bladder during enteric fever is sufficient to show that this organ may yield no symptoms whatever while containing these bacteria. That further, not only may they be present and "silent," but their virulence may, under certain conditions, be entirely lost. At other times again, as has been already shown, the parasite may exist in the bile ducts in a most virulent state and yet produce no lesions. A remarkable case, too, was recently related by Cushing, where in fatal disease, other than typhoid, Eberth's bacillus was present in the gall-bladder, while there was no history of any previous attacks of enteric fever. The symptoms of this infection are usually manifested during the third and fourth week of the disease, though several instances have been described where as early as the eighth day, the gall-bladder was found the seat of the micro-organism. Every variety of inflammation may be the consequence of typhoid infection ; simple catarrhal, suppurative, necrosing and ulcerative, and even diphtheritic. Commonly, perforation is the result of the necrotic process, while in the more chronic inflammation, marked sclerosis of the bile ducts and gall-bladder may be seen. In his able address before the recent meeting of the British Medical Association, Dr. Wm. Hunter referred to an interesting case in point, where a marked subacute inflammation of the gall-bladder had been found at autopsy upon a fatal case of typhoid fever.

It has been asserted, moreover, on good authority that cholelithiasis has followed directly upon the invasion of these micro-organisms, and a casual instance is mentioned here and there in warranty of such a theory. The fact, however, that Hanot discovered typhoid bacilli in the nucleus of a gall-stone, does not necessarily imply that such were the *cause* of its formation, but quite possibly a mere coincidence, while too, one can safely state that anything tending to inflammation of the mucous membrane of the organ will most naturally lead to those conditions by means of which nuclei of gall-stones are most readily formed. Dr. Hunter carefully adds a word of caution against too hasty conclusions in reference to this interesting point.

The gall-bladder itself as the seat of complications is probably the most interesting of all the hepatic regions, both from the clinical and the pathological point of view. Not a little has recently been written upon the diagnosis and treatment of such affections, and with the natural result that this complication has been discovered far more readily than before ; certainly the majority of cases hitherto recorded have been post-mortem discoveries, as shown from statistics collected by Mason among records of the past 60 years.

Diagnosis.—The *diagnosis* of cholecystitis occurring in the course of

typhoid fever may be so obvious as to present not the slightest difficulty; while on the other hand, the symptoms may be so obscure as to wholly mask all signs of the true condition. Typical cases present pain, developing suddenly in the right hypochondrium, the presence of a pyriform tumour, which may be even seen to rise and fall with respiration, and which is movable under the hand, and dull on percussion. Occasionally under very favourable circumstances, fluctuation may even be obtained, and cases are on record where it was possible to diminish the size of the tumour by pressure upon the gall-bladder, which temporarily emptied it of its fluid. But, on the other hand, most marked suppurative and ulcerative conditions may be present in the organ and its size perhaps smaller than normal, while if obstruction occur in the cystic duct, the bladder may be markedly atrophied. The more difficult cases are those where the localised peritonitis causes adhesions to such an extent as to obscure all recognition of the individual organs. But as a rule in such cases there is a sensitive point midway between the ninth costal cartilage and the umbilicus medianly situated, and the abdomen itself may be distinctly distended. As has been pointed out by Dauriac, a characteristic feature consists in the intermission of the symptoms; pain develops suddenly, possibly accompanied by chilly sensations and general malaise, all of which may disappear within a very short time. After 24 to 48 hours the symptoms recur perhaps more markedly, with distension or tumour. The spleen, of course, will be enlarged and the temperature markedly irregular. Instead of running the ordinary course of typhoid, it may suddenly drop to normal, and then become either intermittent or very irregularly febrile. It is an exception to have a typical intermittent temperature such as occurs in the other forms of suppurative hepatic conditions. A curiousf eature of much interest, as well as of value, is the symptom first pointed out by Riedel, who has shown that owing to the distension of the gall-bladder, a tongue of liver substance may be pulled down even below the umbilicus, and can be readily felt on palpation through the abdomen. To sum up again the special features in the diagnosis of typhoidal cholecystitis, we have:

1st. The sudden development of pain in the right hypochondrium.
2nd. The sensitive point above mentioned.
3rd. The presence of a tumour.
4th. The intermission of the symptoms.
5th. The phenomenon of Riedel.

Treatment.—The *treatment* of this complication has been either expectant or operative, varying naturally according to the degree of severity. The operative treatment in Mason's case consisted in the

successful aspiration of the collection in the bladder, though all others have resorted to laparotomy and with variable success. A small proportion only recovered.

In so far as the drug treatment is concerned, antiseptics have been the routine practice in France with the hypothetical idea of eliminating the causative factor. Hence the use of Beta-naphthol, mercury, etc., and with success in such cases where the symptoms were mild and where naturally one cannot with assurance add a *propter* to their *post hoc.*

When *angiocholitis* occurs, the general features are almost identical ; the intermission of symptoms, the irregularity of the temperature, the general malaise and with these, tenderness, and perhaps œdema over the liver area. But Dauriac has further pointed out the importance of watching for premonitory symptoms under these conditions and strongly urges frequent and careful examinations of the urine His observations lead him to believe that in typhoidal involvement of the liver there will be disturbance of urea formation and an altered quantity of urobilin present in the urine. Add to this a disturbed glycogenic function with the presence of minute quantities of sugar in the urine, and the liver tissue can be assumed to be involved. Under such conditions it is necessary to watch most carefully the local condition in the right hypochondrium.

Of the other hepatic complications, such as *abscess*, solitary or associated with phlebitis, these are peculiarly rare and do not offer any points of special interest in connection with the study of enteric fever

The occurrence of *jaundice*, on the other hand, which too is remarkably uncommon, may arise from a variety of conditions. As Dr. Osler has shown, the condition may be due to toxæmia, abscess, gall-stones or cholangitis ; and in all cases its presence may be looked upon as of bad prognostic significance. Where due to a catarrhal condition of the common duct, on the other hand, the prognosis is least grave. Treatment, other than that adopted under other conditions which induce the same symptoms is uncalled for.

C. F. Martin.

Pharmacology and Therapeutics.

UNDER THE CHARGE OF A. D. BLACKADER.

A Guide to the Administration of Drugs.

HARE, H. A. "The rapidity of absorption and elimination of some commonly employed drugs as a guide to their administration."—*Therapeutic Gazette*, September 15, 1877.

The writer while emphasising the importance of a knowledge of the physiological action of drugs as the basis of successful therapeutics, thinks that in our study of this action we are apt to overlook the manner of the absorption and the speed of the elimination of a drug as having a very important bearing on the size and frequency of the dose to be administered. Owing to lack of knowledge on these points we often find that drugs which are slowly eliminated, are given frequently in the twenty-four hours, while drugs which are rapidly eliminated are given at long intervals. All drugs cannot be arbitrarily divided into those which are slowly and those which are rapidly eliminated, but some drugs do lend themselves to such classification, and some of those which are slow of absorption are likewise slow of elimination. It is because drugs which are only slowly eliminated are frequently given too often in the twenty-four hours that the so-called untoward effects of many of them are developed. Unfortunately with regard to many of our drugs, our knowledge of the mode and time of their elimination is by no means complete, and in some cases, owing to the complete destruction of the drug in the body, an exact estimation is almost impossible.

Iodide of potassium is absorbed and eliminated rapidly when taken on an empty stomach, so that there is little tendency for it to accumulate in the system. Nevertheless a certain portion remains uneliminated, partly owing to its being swallowed and reabsorbed with the saliva, and partly perhaps owing to the combination of some of the iodine with the albumen of the tissues forming only slowly soluble albuminoid compounds of iodine. Iodide of potassium should, therefore, be given freely and frequently at first, until the residual amount has reached its limit, as shown by the appearance of some toxic symptoms, when smaller doses will be sufficient to maintain its influence.

Bromide of potassium is absorbed rapidly, but eliminated only very

slowly. Amory found that one-half of the drug was eliminated in twenty-four hours, a remaining third in the next twenty-four, but the balance is only very slowly eliminated. Hence the same rule should be adopted for it as for iodine, viz., to give full doses till some toxic symptoms appear and then lessen the dose. Many neurologists prescribe full doses for one week, and then smaller ones sufficient only to maintain the effect.

The rapidity of absorption and elimination of mercury depends to a great extent on the variety of it employed. While a single dose is generally completely eliminated in 24 hours, elimination becomes very slow when the doses are persisted in.

Antipyrin is rapidly absorbed from the stomach in from fifteen to twenty minutes, but elimination continues for from thirty to sixty hours after the last dose. It should, therefore, not be given in too frequent doses.

Atropine and belladonna are, on the other hand, absorbed with great rapidity, and equally rapidly eliminated by the urine. Aconite is also rapidly absorbed and destroyed by oxidation, so that its effects do not last for any length of time.

Arsenious acid is absorbed fairly rapidly, but eliminated very slowly indeed ; it should, therefore, be given at long intervals rather than in many doses each day.

Hydrocyanic acid and ammonia on the other hand are both very fleeting in their effects, being both rapidly absorbed and eliminated, and to have any steady influence on the system they should be given at comparatively short intervals.

To Stimulate the Absorption of Important Drugs.

HARE, H. A. "Stimulation of the gastric mucous membrane to aid in the absorption of important drugs."—*Therapeutic Gazette*, November 15, 1897.

In an interesting paper presented to the Section on Medicine of the College of Physicians of Philadelphia, the author refers to the fact that the rapidity of absorption from the stomach is greatly influenced by the condition of its mucous membrane and the state of the general nervous system. In cases of profound vital depression, absorption almost ceases. In surgical shock, and in advanced alcoholic coma, he has not infrequently noticed that after repeated large doses of drugs had been given with no results for the time being, absorption commenced as the depression passed off, and the patient was more or less poisoned by the aggregated medicinal doses received. In other instances where the state is less grave, the physician is content to give the

medicine, and then regard it as physiologically active, without considering the possibility of gastric torpor. In some chronic conditions the slow absorption of a remedy is not disadvantageous, but in acute cases its rapid absorption may be of vital importance. It occurred to the writer that it might be possible to combine with a remedy, another substance not possessed of general physiological action, but capable of stimulating the gastric mucous membrane, and so increasing its functional powers of absorption. To test what could be achieved in this way, he made a series of experiments with iodide of potassium, given at one time pure, and later on, after all traces of the first doses had passed off, with the addition of a little powdered capsicum. He found that when he used the latter drug absorption took place about ten minutes earlier than when it was not used. He concludes, therefore, that the use of a gastric stimulant aids very materially in the absorption of another drug, and that it is well to combine such with our remedies in all cases where rapid absorption is desired, or when we have any reason to believe that the stomach is in a state of atony.

Treatment of Anæmia or Chlorosis.

LATHAM, P. W. "On the treatment of anæmia or chlorosis,"—*The Practitioner*, October, 1897.

In discussing the reason why this apparently simple disorder is often so intractable, the writer thinks that remedies frequently are not used in the right way or under proper conditions. The food if taken in proper quantities contains sufficient iron for the wants of the system under normal conditions, but often the condition of the alimentary tract may be such as to prevent its absorption, or, after it is absorbed, the blood-forming organs may be so inert as not fully to utilize it. Dr. Latham thinks that morbid ferments in the intestinal canal, by the development of alkaline sulphides convert the organic compounds of iron into sulphides which cannot be absorbed, and which consequently pass off with the fæces. When iron is administered medicinally, not only is a proportion of it absorbed, but, by combining with the alkaline sulphides in the intestine, it protects the organic compounds of iron in the food and thus permits their absorption. The dose of iron at first should be small, and then gradually increased as the patient becomes tolerant of the remedy. While the milder preparations of iron are more readily borne, yet, when the patient is able to take it, he regards the tincture of the perchloride as the most efficacious. This is probably due to the presence in it of

free chlorine. The addition to it of acetic or sulphuric ether appears to stimulate its absorption.

Dr. Latham recommends the following combination of remedies as very serviceable in the treatment of chronic forms of chlorosis.

℞	Tinct. Ferri Perchlor.	♏ x-xx.
	Sp. Ætheris Sulph.	♏ x-xv.
	Tinct. Nucis Vom.	♏ x.
	Tinct. Quassiæ	♏ xxx.
	Aquæ ad	℥ iss. misce.

This is to be taken twice a day, an hour before luncheon and dinner. Instances, he says, occur in which iron is not tolerated by the patient even when given in very small doses; either the stomach is intolerant of the remedy or the head suffers. In cases also, which appear to be verging towards the form of the so-called "pernicious" anæmia, iron is not very effective. In such cases the administration of arsenic is often followed by most satisfactory results. In the writer's opinion, the efficacy of arsenic is diminished if combined with iron, but the addition of acetic or sulphuric ether appears to render its action more energetic. Dr. Latham dissents from the doctrine that when iron is tolerated in chlorosis the remedy is only effectual when administered in large doses. Such doses, he thinks, not infrequently set up considerable intestinal irritation, and a febrile condition, with palpitation or headache. More effective than the administering of large doses is the ensuring of a daily, satisfactory action of the bowels. One of the most useful laxatives in these cases is the aloes and iron pill of the pharmacopœia taken daily before dinner. It should be recently prepared, and with it small doses of belladonna may be combined with advantage. Cascara is also a useful remedy, but saline purgatives he thinks are objectionable. Laxatives also containing sulphur, such as the compound liquorice powder, sulphur tabloids, etc., should not be used in chlorosis. On the other hand, the antiseptic action on the intestinal contents of mercury in small doses may often be of service. Diet should be nutritious and of an easily digestible character. The last, but by no means the least, important point in the treatment is the necessity for chlorotic patients to avoid fatigue. They should have rest both of mind and body. A little over-exertion does away with the result of three or four days care. Plenty of fresh air without much exercise, twelve hours in bed and a rest on the couch after luncheon and dinner will often do much to contribute towards the recovery of these patients.

The Treatment of Habit Chorea.

SINKLER WHARTON. "The treatment of Habit Chorea.—*Journal of Medical Sciences*, May, 1897.

The writer at the close of an interesting article on this affection, speaks of its treatment as follows: The majority of cases depend upon some distinct and positive cause, which careful investigation will usually discover. It is essential therefore in every case to determine the existance of a cause, and to take measures for its removal. In cases of long standing however, it is not sufficient merely to get rid of the cause, for the nerve centres having acquired a vicious habit do not recover their normal condition until systematic treatment has been pursued. This is especially observable in those cases in which habit chorea has resulted from an error of refraction. It has been found that medicinal treatment alone seldom arrests the choreic movements. On the other hand, mere correction of the refraction does not cure them. It is necessary first to correct the ocular defect, and then pursue a course of medicinal treatment. The same statement applies to those cases in which nasal or throat disease has been the cause of the affection. In nearly all cases the general health is at fault. The patient is anæmic, or is run down from overstudy, improper food, or some attack of illness. Tonics, more especially chalybeates are called for; and if possible change of air is to be obtained. Arsenic is the one drug which seems to exert a special influence upon the disease. It is seldom of value when given in small doses but should be given in gradually ascending doses until some toxic influence is observed. In some cases when the internal administration was not successful, Weir Mitchell has effected cures with its exhibition hypodermically. The question as to whether the patient should be urged to control the movements by an effort of the will, and also as to whether in children any form of punishment should be used are mooted points. In the writer's opinion the patient should in all cases be encouraged to make every effort to check and control them. Any form of punishment in children for the movements is to be deprecated, but in every case much can be done by the promise of reward. In all cases it is important to secure as quiet and uneventful a life as possible and a modified course of rest treatment gives the most speedily beneficial results.

A. D. Blackader.

Ophthalmology.

UNDER THE CHARGE OF J. W. STIRLING.

Holocain—The New Local Anæsthetic.

E. Tauber.—*Centralblatt für praktische Augenheilkunde*, February, 1897.

R. Kuthe.—*Centralblatt f. prakt. Augenheilkunde*, February, 1897.

R. Heinz.—*Centralblatt f. prakt. Augenheilkunde*, March, 1897.

R. Heinz and C. Schlosser.—*Zehender's Klinische Monatsblatter*, April, 1897.

Gutmann.—*Deutsche Med. Wochenschrift.* March 11th, 1897.

Hirschfeld.—*Zehender's Klin. Monatsblatter*, May, 1897.

R. Brudenell Carter.—*Lancet*, May 29, 1897.

The following is a condensed synopsis of the contents of the above articles on this new local anæsthetic, which bids fair so far to supplant cocain in many cases of eye disease.

It is used in 1 per cent. solution instilled into the eye, causes very slight irritation, and produces anæsthesia in one minute or less, which anæsthesia lasts ten minutes, it is thus more rapid in its action than cocain.

It does not dilate the pupil like cocain does, and it rather lessens the intraocular pressure.

It is more readily absorbed by the ocular tissues than cocain, hence is more useful in cases of ocular chemosis where the absorption of cocain is very slow.

In sterilising it, it decomposes if there is the slightest trace of alkalinity present, hence it should be heated in a porcelain not a glass vessel when it is sterilised.

It can not be used subcutaneously as it is very toxic, the pulse and respirations are greatly increased in frequency, and death results from tetany of the respiratory muscles.

In regard to the sterilising, several of the above authors consider this to be unnecessary as a 1 per cent. solution of holocain is directly bactericidal.

Holocain is a derivative of p. phenetidin like phenacetin, feebly

soluble in cold water, 2½ per cent., soluble in ether, alcohol and hot water. It melts at 121 degrees (Cent), neutral reaction, not decomposed by heating, but when heated in glass vessels some free alkali is given off which affects the glass, hence it should be heated in a porcelain vessel.

A one per cent. solution remains clear for two months.

The Ocular Complications of Typhoid Fever.

Charles Stedman Bull, M.D.—*Medical Record*, April 24th, 1897.

In typhoid fever the eye symptoms are either a part of the infectious disease itself or one of its sequelæ, whereas in most infectious diseases the eye disturbances occur among the prodromata or in the early stage of the disease. This fact may be of use in the diagnosis, as in doubtful cases of measles.

The main eye lesions are :

1. Catarrhal conjunctivitis with very little secretion.
2. Phlyctenular conjunctivitis and keratitis especially during convalescence.
3. Loss of accommodation and dilatation of the pupil due likely to a general asthenic state.
4. Retinal hæmorrhages in bad cases generally at height of disease.
5. Amaurosis from anæmia due to great loss of blood elsewhere in body ; there is a tendency for these cases to end in optic atrophy.
6. Paralyses of external muscles of eye, said to be due to a chronic nephritis, are nuclear and recover rapidly but with tendency to relapses. Others hold these paralyses are due to direct action of the typhoid poison setting up a neuritis.
7. Neuro-retinitis or retrobulbar neuritis is rare, said to be due to a localized meningitis at the base of the brain and apt to end in atrophy of the optic nerve.
8. Inflammation of the iris, ciliary body and choroid varying in intensity, and never purulent, but always serous and plastic.

Treatment of Exophthalmic Goitre.

Charles Abadie.—*La Clinique Ophthal:*

After mentioning failures in other treatment Abadie strongly advises the division of the cervical sympathetic below the middle ganglion, for the vasodilator fibres which go to the superior and inferior thyroid arteries emanate from the superior and middle ganglia.

Therefore, if we cut below the middle ganglion we shall cut off the paths of the vaso-dilatation which provokes and keeps up the hypertrophy of the thyroid gland.

Arthritis Secondary to Gonorrhœal Conjunctivitis.

L. Weiss and W. Klingelhoffer.—*Klin: Mon. f. Augenheilkunde*, March, 1897.

This fully reported case is very interesting.

The patient, a male nurse, thirty-five years old, while making an injection in a case of gonorrhœa accidentally got some of the discharge in his right eye.

Under treatment his eye recovered, but two months later, swelling and pain attacked his right knee joint, with some fever. The knee got well in eight or nine days, but fourteen days later the right ankle joint also was affected, recovering in eight days.

The possibility of the patient having urethral gonorrhœa was carefully excluded.

Puncture of the joint unfortunately was not made to discover if the gonococcus existed in the secretion of the joint.

Arthritic disease following gonorrhœal conjunctivitis is very rare, only fifteen cases have been so far reported.

Bacteriological examination was made in five of these cases and in three cases cocci were found.

Cataract and its Association with the Gouty and Rheumatic Diathesis and their Relation to Diseases of the Eye.

S. D. Risley, M.D.—*University Medical Magazine*, June, 1897.

There are some very suggestive and valuable hints in this exhaustive article of Dr. Risley's.

Dr. Risley refers to the distinct clinical relationship between ocular affections and the lithic acid diathesis. The eye symptoms from which many persons suffer disappear promptly under open air exercise with the deeper breathing and increased excretion. The blood vessels and tissues are relieved of the accumulation of the products of imperfect metabolism.

While the relation of these ocular discomforts to the milder or incipient forms of lithæmia are overlooked, it is quite as common to neglect the important bearing this diathesis has upon the serious affections of the eye which appear in or after middle life.

Cataract would arise, from its impaired nutrition due to the altered condition of its environing fluids in this diathesis, just as the presence of naphthalin, or sugar in the system cause loss of transparency of the lens, presumably through some change in the normal osmotic qualities of the fluids in and around the lens.

It is a significant clinical fact that the ectodermic tissues of which the lens is one, and the connective tissue in and about the joints where it is most dense and comparatively avascular, and, therefore where nutrition is most easily retarded, are precisely the localities which suffer earliest and most constantly in the evolution of gout.

Canadian Medical Literature.

UNDER THE CHARGE OF KENNETH CAMERON.

[The editors will be glad to receive any reprints, monographs, etc., by Canadian writers, on medical or allied subjects (including Canadian work published in other countries) for notice in this department of the JOURNAL. Such reprints should preferably be addressed to Dr. Kenneth Cameron 903 Dorchester street, Montreal.]

PERIODICALS.

AUGUST, 1897.

THE CANADIAN PRACTITIONER.

Notes on some peculiar phases in appendicitis—J. F. W. Ross, Toronto, p. 547.

Inter-cranial syphilis—A. McPhedran, Toronto, p. 561.

A plea for the radical operation for hernia among the insane—H. T. Hobbs, London, Ont., p. 567.

THE CANADA LANCET.

Cystic tumours of the ovary complicating pregnancy, with notes from cases—H. Meek, London, Ont., p. 586.

A case of acute insanity due to eye-strain—Murray McFarlane, Toronto, p. 591.

THE CANADIAN MEDICAL REVIEW.

A case of typhoid fever—J. Hart, Toronto, p. 43.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Vaginal section—Ernest Hall, Victoria, B. C., p. 567.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

The culture, diagnosis, and serum treatment of puerperal fever—George T. McKeough, Chatham, Ont., p. 47.

Primary tuberculosis of the breast occurring during pregnancy—George T. McKeough, Chatham, Ont., p. 49.

Some thoughts on intestinal catarrh and cholera infantum—H. Morell Slayton, Minnesota, p. 51.

CANADA MEDICAL RECORD.

Convenient local anæsthetics in minor surgery—Geo. Fisk, Montreal, p. 557.

Serum-therapy results—J. B. McConnell, Montreal, p. 562.

THE MARITIME MEDICAL NEWS.

Our duty as physicians and citizens in the work of sanitation and preventiv medicine—J. F. McDonald, Hopewell, N. S., p. 261.

Clinical evidence of the identity of the micro-organisms of erysipelas an puerperal septicæmia—Duncan Murray, Lower Stewiacke, N. S., p. 270.

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Troubles nerveaux en rapport avec les maladies de l'oreille—A. A. Foucher, Montreal, p. 449.

Des injections salines dans le traitement de la pneumonie, spécialement chez les vieillards—J. A. Lesage, Paris, p. 457.

Décroissance rapide d'une tumeur fibreuse de la matrice à la suite du traitement par l'électricité—A Lapthorn Smith, Montréal, p. 464.

Onze cas d'insolation—E. P. Benoit, Montréal, p. 468.

La Revue Médicale.

Cholédochtomie—M. J. Ahern, Québec, p. 9 (No. 2).
Cas de placenta prævia—P. V. Faucher, Québec, p. 17 (No. 3).
Manifestations pathologiques à distance dans les maladies du nez—L. N. J. Fiset, Québec, p. 25 (No. 4).
Etude sur la cause ou condition première de toute maladie—C. R. Paquin, Québec, pp. 33-41 (Nos. 5 and 6).

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The Canadian Practitioner.

Special Lister number.

The Canada Lancet.

Inertia of the uterus following the use of chloroform—J. B. Williams, Ingersoll, Ont., p 1.
Hæmorrhagic pancreatitis—C. B. Shuttleworth, Toronto, p. 6.

Canada Lancet—Special Edition.

Commemorating the meeting of the British Medical Association at Montreal, August 28th, 1897.

The Canadian Medical Review.

Two unnamed diseases—James Samson, Windsor, Ont., p. 77.

The Dominion Medical Monthly and Ontario Medical Journal,

Proceedings of the British Medical Association, Montreal meeting, 1897.

The Canadian Journal of Medicine and Surgery.

Address in surgery—W. Mitchell Banks, p. 103.
Proceedings of the British Medical Association, Montreal meeting, 1897, p. 121.

The Canada Medical Record.

Opening address at the 65th annual meeting of the British Medical Association—T. G. Roddick, Montreal, p. 613.
Address in medicine—Wm. Osler, Baltimore, p. 632.

The Maritime Medical News.

Milk as a medium for the spread of disease—J. W. Daniel, St. John, N. B., p. 297.
Fracture of spinal vertebræ—John Stewart, Halifax, N. S., p. 307.
A case of extra-uterine fœtation—H. H. Read, Halifax, N. S., p. 307.

L'Union Médicale du Canada.

L'œuvre de Pasteur et la conception moderne de la médecine—Le Professor Charles Richet, délégué du Gouvernement Français et de la Faculté de Médecine de Paris à la 65e réunion de l'Association Médicale Britannique, p. 513.
Séro-diagnostic de la fièvre typhoïde—Fernand Widal, Paris, p. 526.
Les progrès de l'hygiène au Canada—E. P. Lachapelle, Montréal, p. 530.
Deuxième contribution à l'étologie de la dacryocystite—A. A. Foucher, Montréal, p. 537.
Anatomie pathologique et cure radicale du pied bot varus équin congénital—Amédée Marien, Montréal, p. 540.
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Influence de la lumière sur les microbes—Fred. Boulanger, Québec, p. 49 (No. 7).

De la vaccination obligatoire—Arthur Simard, Québec, pp. 57-65 (Nos. 8, 9).
Considération sur les affections syphiliques de l'œil—Jules Jehin-Prume, Montreal, pp. 73-81 (Nos. 10, 11).

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Treatment of gastro-intestinal catarrh—H. D. Livingstone, Rockwood, Ont., p. 710.
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Axillary lipoma—D. W. McPherson, Toronto, p. 49.
Treatment of beginning deafness—Murray McFarlane, Toronto, Ont., p. 51.
Tubal pregnancy diagnosed before rupture ; cœliotomy and recovery—W. R. Nichols, Baden, Ont., p. 53.

THE CANADIAN MEDICAL REVIEW.

Is there such a disease as glandular fever?—W. Graham, Toronto, p. 111.

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Some remarks regarding climate—Dr. Ames, Denver, Col., p. 797.
The relationship of the medical man to the state—J. R. Hamilton, Port Dover, p. 804.
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Vaginal section, clinical report—Ernest Hall, Victoria, B. C., p. 812.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Preventive medicine in the city of New York—Herman M. Biggs. p. 185.

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Extra-uterine pregnancy—George I. McKenzie, Pictou, N. S., p. 333.

Case of pylorectomy with gastro-jejunostomy for carcinoma—A. B. Atherton, Fredericton, N. B., p. 337.

Report of a case of tetanus following a severe and extensive wound of the head, treated successfully with antitoxin of tetanus—W. D. Finn, Halifax, N. S., p. 342.

Needle in tooth, located by the electric current—W. D. Finn, Halifax, N. S., p. 348.

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L'application de l'entomologie à la médecine légale—Wyatt Johnston et Georges Villeneuve, Montréal, p. 677.

Association Médicale Britannique, Montréal, 1897—Discours publics et travaux des sections.

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De la tenorrhaphie, son historie et sa thérapeutique chirurgicales appuyées d'une observation—Alfred V. Roy, Levis, p. 89 (No. 12).

Phimosis et ses complications—Henri Lasnier, Paris, p. 97 (No. 13).

Sur un cas de grossesse gémellaire avec avortement et expulsion des fœtus ainsi que des annexes à des époques différentes—F. X. Jules Dorion, Québec, p. 105 (No. 14).

British Medical Journal.

Sixty-fifth annual meeting of the British Medical Association at Montreal, pp. 853, 909, 911, 945, 1041, 1101.

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Introduction to a discussion on appendicitis—G. E. Armstrong, Montreal, p. 945.

Ventral and umbilical hernia in the same patient—A. E. Garrow, Montreal, p. 950.

Accurate measurement of the spinal curvature, with a description of a new instrument for the purpose (illustrated)—R. Tait McKenzie, Montreal, p. 959.

Gunshot wound of the spinal cord (illustrated)—George A. Peters, Toronto, p. 961.

Dislocation of the kidney—J. F. W. Ross, Toronto, p. 965.

Successful removal of an enormous mesenteric tumour and nearly eight feet of intestine—Francis J. Shepherd, Montreal, p. 966.

Case of strangulation of a loop of ileum through a hole in the mesentery, with a Meckel's diverticulum attached—A. B. Atherton, Fredericton, N. B., p. 975.

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Empyema of pneumonia, with four cases—Dr. MacKinnon, Guelph, Ont., p. 1057.

A discussion on the operative treatment of high cancer of the rectum—Introduced by James Bell, Montreal.

The comparative frequency of appendicitis as a complication of pus tubes, with some remarks on the technique of removing the appendix—A. Lapthorn Smith, Montreal, p. 1071.

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A discussion on hyperemesis gravidarum—Introduced by J. A. Temple, Toronto, p. 1137.

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Obliteration of the cervix uteri—J. Lippé, St. Ambroise de Kildare, Que., p. 1143.

A discussion on the diagnosis and treatment of intra-pelvic tuberculous disease—Introduced by James F. W. Ross, Toronto, p. 1144.

A discussion on the palliative and radical treatment of uterine flexions and displacements—Introduced by A. Lapthorn Smith, Montreal, p. 1151.

Notes on methods and results in the Burnside Lying-in Hospital, connected with the Toronto General Hospital, Toronto, Canada (with charts)—Adam H. Wright, Toronto, p. 1156.

On gauze packing of the pelvis in gynæcological operations—T. Johnson-Alloway, Montreal, p. 1164.

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Introduction to a discussion on the relation of rheumatoid arthritis to diseases of the nervous system, tuberculosis and rheumatism—James Stewart, Montreal, p. 1225.

Atony of the rectum—Geo. Acheson, Galt, Ont., p. 1230.

Kenneth Cameron.

Reviews and Notices of Books.

The American Academy of Railway Surgeons. Report of the Third Annual Meeting held in Chicago, Sept. 23, 24, 25, 1896. Edited by R. Harvey Reed, M.D., Columbus, Ohio. Chicago: American Medical Association Press.

The contents of this volume are divided into six chapters. It contains also the Constitution and By-laws, an official list of Fellows and a roll of Honorary Members. The first chapter is taken up with the proceedings of the executive session, the second chapter refers to expert testimony in Medicine and Surgery. The President's Address, by John E. Owens, of Chicago, was on this subject, and he was followed by Robt. Mather, General Attorney of the Chicago, Rock Island and Pacific Railway, opening up a discussion in which a number of those present took part. In the third chapter a number of papers, on subjects more or less intimately connected with railroad surgery, are gathered together. Fractures and bone trauma occupy the whole of the fourth chapter, and injuries of the joints the fifth. The last chapter is devoted to injuries of the eye. The subjects discussed throughout are of great interest to any surgeon connected with the railroad, and the volume will well repay perusal by all such. R. C. K.

Lectures on the Malarial Fevers. By W. S. Thayer, M.D., Associate Professor of Medicine in the Johns Hopkins University. New York: D. Appleton & Co. 1897.

There are few authorities so capable of discussing from every point of view the malarial fevers as is Dr. Thayer, and his numerous previous contributions have been among the most valuable in the literature. Recently, in association with Prof. Welch, he has published a comprehensive article on the same subject, and his present volume, while quite exhaustive, has the merit of bringing into one book even the most recent observations of the present year.

Stress is laid in the early portion of the work on the pernicious habit among general practitioners of giving to any obscure disease the title of malaria, and the emphatic necessity of calling attention to the fact is obvious on glancing at the New York Statistics of Health. Here the officials publish the appalling fact that malaria is more common than typhoid and other fevers, and the same is held to be true of Brooklyn—an error of the most glaring type.

Probably the chief interest in Dr. Thayer's book rests with the clinica details, while the large series of case reports culled from his own large

experience as illustrating features of importance is most valuable ; so too with the numerous charts and excellent plates.

The Pathology and Morbid Anatomy are dealt with minutely, and include full descriptions of the recent interesting researches of Barker, on cirrhosis, mixed infections, etc., as also the observations of Bastianelli on Malarial Hæmoglobinuria.

The writer has evidently but little patience with the "mosquito theory" of Manson, and adheres as of old to the belief that the flagellate bodies are very probably mere evidences of degeneration.

All in all the work is most complete and but another evidence of the author's careful and exact methods of observation. C. F. M.

A Handbook of Medical Climatology, Embodying its Principles and Therapeutic Application, with Scientific Data of the Chief Health Resorts of the World. By Dr. S. Edwin Solly, late President of the American Climatological Association. Lee Brothers & Co. Philadelphia and New York. 1897.

It is with much pleasure that we greet the appearance of a systematic treatise on the very important subject of medical climatology. For many years past there has been a growing appreciation, not only on the part of the profession, but on that of the public at large, of the value of climate in the prevention and treatment of disease. Up to the present, the means of obtaining accurate knowledge of the all important meteorological data for estimating the true value of the various health resorts has been very inadequate, and the physician has had either to rely on very biased advertisements or to take the casual opinion of patients or other laymen who have visited certain resorts, and select accordingly.

In the present volume the author treats of the whole subject in a scientific spirit. The first section deals broadly with the principles of medical climatology ; principles, which the author refers to in the very able address which we publish in the present issue. In the second section the therapeutics of climate in relation to disease are discussed. No attempt has been made to prescribe special climates for special diseases, but the author presents us with the most exhaustive consideration of the climatic treatment of phthisis that we have anywhere seen. The effect on the tuberculous process of pure air, sunlight, sunheat, temperature, humidity of soil, and of air, variability of temperature, mobility of atmosphere, altitudes, &c., are all discussed. The influence of the various climates upon pulmonary tuberculosis in its several stages is described, and general conclusions are drawn as to the class of cases suitable to the different types of health resorts.

The third section of the work is devoted to a description of special climates in every continent. Comprehensive and comparative climatic studies are presented. American climates are most excellently described and illustrated with maps, some of them in colour relief.

We have very much pleasure in recommending this work to those of our readers who are in need of such a work; and, indeed, we may ask, who in our profession at the present day is not? The work as a whole, whether we consider it as a mere work of reference on climatic resorts, or as a treatise on climatology from a medical point of view, is the most scientific and exhaustive that has so far been placed before the English speaking profession. A. D. B.

A Text-Book of Bacteriology, including the Etiology and Prevention of Infective Diseases. By Edgar M. Crookshank, M.B., Professor of Comparative Pathology and Bacteriology, King's College, London. Fourth E dition, large oct., pp. 712. London: H. K. Lewis. 1896.

This fourth edition of Professor Crookshank's well known work has been so materially reconstructed and enlarged as to be to all intents and purposes a new work, a work also so individual in its character, so different from the ordinary run of text-books, that the reviewer has purposely delayed giving any notice until opportunity should present itself for leisurely reading and study of the same.

Without hesitation it must be freely admitted that the work is of great value—indispensable to the bacteriological investigator as a work of reference, but at the same time useless to the student as a text-book. For a text-book, even if the author personally disagrees with the usual teaching of the schools, ought to state faithfully what that teaching is, so that the student may be conversant with prevailing opinion. By this I do not mean that the author of a text-book should sink his individuality. I mean simply that that students cannot be considered properly taught who are not fully acquainted with the prevalent views upon the subject. Thus it is not correct to put into the hands of the student a book which teaches that the specific nature of the bacilli of cholera and typhoid is still a matter of doubt, without, at the same time, stating very distinctly that such a view is contrary to that of the vast majority of bacteriologists; it is not in accordance with generally accepted ideas to deal with smallpox and vaccinia as two wholly separate conditions and to dismiss peremptorily the view that the two are different manifestations of the action of one and the same virus, which in vaccinia has become modified by transmission through the cow. Similarly it is not right to tell the ingenuous youth that the real nature of the contagion in bubonic plague is unknown, or that the exact relations of the mycelial fungus to madura foot or mycetoma pedis is an open question. Now Professor Crookshank does all these things, and of necessity his work stands condemned as a text-book.

Regarded, however, as a Treatise upon Bacteriology for advanced students and investigators the book is, as I have already stated, of high value. It contains a mass of matter bearing upon the etiology of infec-

tive diseases which it is difficult to find in other works of reference; it is especially rich and suggestive in its treatment of the infective diseases of the domestic animals, it has a useful appendix upon the pathogenetic moulds and protozoa—microbes neglected in nearly all bacteriological text-books. (Had this been still further amplified and brought up to date we should have been more grateful). And lastly it is replete with references to the author's own work and own views which depart very frequently from those generally accepted. It is this last feature which gives the work its peculiar value. It is very soon evident from a perusal of almost any portion of the work that Professor Crookshank is an isolated investigator, one who mixes little with the main body of workers, and who has his own, at times, peculiar manner of regarding everything bacteriological. It is most healthy to turn to his pages as a corrective. The book is the work of one who is by constitution heterodox and a dissenter. It is well to have a good exposition of the other side of the case, and Professor Crookshank seems often to take that other side by preference.

It only remains to be added that excellent as were the illustrations and paper and printing of the former editions, the present otherwise is more admirably illustrated and more sumptuous than they, or than any previous work upon bacteriology. J. G. A.

Tuberculosis of the Genito-Urinary Organs, Male and Female. By M. Senn, M.D., Ph.D., LL.D., Professor of the Practice of Surgery and Clinical Surgery, Rush Medical College, Chicago. Large oct. pp. 317. Philadelphia: W. B. Saunders, 1897.

We have so great a respect for Dr. Senn as a brilliant and untiring surgeon, as a man of wide interests and attainments, that we cannot but wish he had more leisure for writing. The work before us covers a field in which there is need for full and adequate treatment by a well equipped writer. Now Dr. Senn is well equipped: he has here brought together the scattered literature of his subject, and what is more, he gives us his own abundant and most valuable clinical and operative experience. These considerations alone give the work a very definite value. Nevertheless we have to complain, as was our unpleasant duty upon a former occasion, that the volume is vitiated in places by the evidences it presents of hurried workmanship. It is true that now we have no longer to adversely criticise the absence of bibliographical references, that many parts of the book are excellently written, that the illustrations are, without exception, excellent—a statement which could not be made concerning the work on tumours. But there are still too many paragraphs which appear to be mere abstracts of articles taken word for word from the author's commonplace book. Thus in some places page after page appears to give the varying results of different observers without adequate criticism of the relative value of their results, or adequate attempt to epitomise them and to sum up the main conclu-

sions to be drawn. Indeed it is difficult at times to determine whether a given opinion is that of the author or of the authority he has just been quoting. That Professor Senn is so phenomenally busy a man is not a sufficient excuse for the publication of imperfectly digested material.

This much, however, must in justice be said, that those interested either as surgeons or as pathologists in the tubercular diseases of the organs of generation, have here brought before them a large body of most valuable material, material much of which first saw light in the form of inaugural dissertations and theses, and so is practically inaccessible to the ordinary worker. It is a work which all interested in genito-urinary surgery and pathology must possess. J. G. A.

Essentials of Bacteriology; being a concise and systematic introduction to the study of Micro-organisms for the use of Students and Practitioners. By M. V. Ball, M.D. Third Edition, revised, with eighty-one illustrations, seven in colours and five plates; pp. 210.

Although this work has reached a third edition, and is stated to be revised, the amount of revision still requisite is such that what its earlier condition must have been is painful to consider. Opening the work at random we find such statements as the following: "Shortly after birth micro-organisms are found in the stomach, *though it is claimed by some* (the italics are ours) that they are absent at birth." On the next page "the bacteria of cholera, *dysentery* typhoid," and lower down "tubercle bacilli *seldom, if ever, enter this secretion*" (the blood). Or again of anthrax bacilli," The bacilli are found wherever the capillaries are spread out, in the spleen, liver, . . . and *in the blood itself*" "The bacilli can be inhaled and then a pneumonia is caused . . . ; when the spores are inhaled a general infection occurs." "The anthrax disease seems confined to certain districts in Silesia, Bavaria and Auvergne" (as though it does not occur in every part of the world). "The bacillus has never been found free in nature" (as though its spore stage was not the main cause of the continued infection of certain localities, and Pasteur's classical researches upon earth worm casts were unknown to the author).

The work, in short, is too concise for the author to make his meaning clear, and while it may be of use to the student who wishes to cram and scrape through his examinations, it is useless for the serious student, while the practitioner interested in bacteriology must seek some fuller and more satisfactory presentation of the subject. A.

Principles of Bacteriology. By A. C. Abbott. Philadelphia, Lee Bros., fourth editlon enlarged and thoroughly revised. 1897.

We are glad to welcome a further edition of this sound and admirable work, a work which by its precision of detail and sound treatment of the essentials of bacteriology stands in marked contrast to that above reviewed. A.

Michigan Monthly Bulletin of Vital Statistics. Edited by Cressy L. Wilbur, M.D., Chief of Division of Vital Statistics. Vol. 1. No. 1. September, 1897.

We have received from the Department of State, Lansing, Michigan, a copy of the above new departure in public health and we heartily congratulate the state authorities and the inhabitants of Michigan upon a notable advance.

By a law which came into force upon August 29th, 1897, all deaths in Michigan are immediately registered, with the exception of those occurring in a few sparsely populated districts, and the registrars are required to mail the returns for one month on or before the 4th of the month next succeeding. Thus for the first month in which the law was operative reports were received in time for compilation in this monthly bulletin from a total population of 2,061,616 persons according to the census of 1894, or, in other words, 93 3 per cent. of the total registrable population of the State.

Within a few days these reports are tabulated and printed in proper order, the total number of deaths for the month is recorded, together with the corresponding annual death rate thus indicated. It is immediately recognized if any one form of disease is especially rife in any urban or country district, and if this be a preventible disease public opinion is immediately directed to the matter. In this return, for example, it is noted that a greater death rate from typhoid occurred in the country than in the larger towns, and the necessity for greater care in the water supply of the smaller towns (under 5,000 population) is immediately suggested. Attention is also directed to what may be the beginning of an epidemic of cerebro-spinal meningitis, twenty-five deaths having occurred. As the disease had not seriously shown itself in Michigan for the last quarter of a century, the attention of medical men and health officers is called to the possibility that serious efforts may be demanded for its restriction.

Already by the operations of the law the death rate based upon the September returns shows, according to the editor, an increase in accuracy of about fifty per cent. as compared with the old system of yearly and more haphazard returns. In short this new law renders the prompt publication of the data possible at a time when they can be of importance and practical use to the sanitary offices of the State as well as of interest to the public.

Despite the efforts of Dr. E. P. Lachapelle and his excellent staff, we in this Province of Quebec are miserably and mediævally behindhand in this matter of registration of deaths—as also of births. We fervently hope that the great advance made by other states and provinces may at last stimulate the Government to inaugurate a system which, if not so admirable as that devised by Michigan, will at least not cause strangers and those in the other provinces of the Dominion to point the finger of scorn at us. A.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

Twenty-seventh Annual Meeting.

GEO. WILKINS, M.D., PRESIDENT, IN THE CHAIR.

The following members were present:—

Drs. J. G. Adami, G. E. Armstrong, James Bell, A. D. Blackader, E. H. Blackader, G. A. Brown, G. G. Campbell, D. J. Evans, F. G. Finley, William Gardner, A. E. Garrow, D. F. Gurd, D. A. Hart, J. M. Jack, F. A. L. Lockhart, C. F. Martin, J. B. McConnell, S. R. MacKenzie, A. E. Orr, T. D. Reed, W. G. Reilly, F. J. Shepherd, A. L. Smith, James Stewart, F, E. Thompson, and C. F. Wylde—28 in all.

Dr. W. I. Bradley, of Montreal, was elected an ordinary member.

Dr. J. M. JACK read the Treasurer's annual statement, showing an expenditure for the past season of $708.90 and receipts of $802.01. leaving a cash balance on hand of $93.05. The assets amounted to $668.05 and the liabilities to $123.42, leaving nett assets of $544.63.

The Secretary's report showed an average attendance at twenty regular meetings of 37. Ten new ordinary members had been added to the roll, making a total of 145 ordinary members. Lord Lister had been elected an honorary member.

The work done for the previous session was classified os follows :

	Medicine.	Surgery.	Obstetrics.	Gynæcology.	Ophthalmology.	Pediatrics.	Dermatology.	Orthopedics.	Anatomy.	Physiology.	Pathology.	Legal Medicine.	Public Health.	
Living cases	3	10	....	....	....	....	4	....	....	1	....	....	....	18
Pathological specimens	8	9	....	3	....	....	....	....	....	....	5	3	....	28
Case reports	13	6	1	2	....	....	2	....	1	....	2	1	....	28
Papers	2	2	....	2	1	1	....	1	....	1	3	1	....	14
Discussions	....	....	....	1	....	....	....	....	....	....	....	....	2	3
	26	27	1	8	1	1	6	1	1	2	10	5	2	91

Dr. F. A. L. LOCKHART presented the Librarian's report.

The following officers were elected for the session of 1897-98.
President—Dr. Robert Craik.
First Vice-President—Dr. Wyatt Johnston.
Second Vice-President—Dr. J. A. MacDonald.
Secretary—Dr. Ridley Mackenzie.
Treasurer—Dr. James Jack (re-elected).
Librarian—Dr. F. A. L. Lockhart (re-elected).
Council—Dr. Geo. Wilkins, Dr. F. J. Shepherd, Dr. Jas. Perrigo

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Stated Meeting, October 22nd, 1897.

Robert Craik, M.D., President, in the Chair.

Dr. A. G. Nicholls, of Montreal, was elected an ordinary member.

Pyopericardium following Pleuro-Pneumonia; Pericardiotomy, with Recovery

Dr. J. B. McConnell showed a man who had been the subject of this disease and was successfully relieved by the operation. The main points of the case were as follows:

The patient, aged 33, a jeweller by trade, was first seen on April 12th, 1897. On the previous day he had suffered from pain in the lower part of the left side of the chest and in the abdomen. There was a history of grippe two months before, followed by recovery, a cough remaining. On the first examination, there was nothing discovered to account for the pain which was in the region of the diaphragm. The pulse was 120, respiration 24, and temperature 103°. Two days later an area of pneumonia was detected in the upper lobe of the left lung and the following day consolidation at the base also. On April 21st, the tenth day of the disease, pain at the left margin of the sternum was complained of and pericardial friction was made out; the other symptoms had in the meantime abated and the lung was beginning to clear. On the 23rd it was noted that alternate systoles gave an accentuated sound, although the rhythm was normal, and by the end of the month fluid could be detected in the pericardium. From this time on the temperature remained normal.

May 1st to 10th.—The pericardial fluid kept increasing, causing difficulty, pain in swallowing and some dyspnœa.

May 12th.—Examination showed diminished expansion on the left side, no visible cardiac impulse, the interspaces widened and these and the epigastric region somewhat prominent. The upper margin of the first rib could be traced to the sternal articulation. Dulness at the 4th rib extended from $1\frac{3}{4}$ inches on the right of the sternum to an inch beyond the left nipple, and to the 4th space in the mid axilla; and

from the top of the 2nd left costal cartilages to the liver which was depressed some two inches. The sternum and 5th right intercostal space were absolutely flat. There was also a dull note behind, occupying an area 3 inches transversely and from the 9th to the 12th vertebræ; this dulness gradually reached to the angle of the scapula. involving the side completely below this into the axilla. By means of the phonendoscope the heart could be mapped out and differentiated from the dulness of the surrounding fluid and the liver. The patient could not swallow any solids, and liquids caused pain.

May 14th.—Paracentesis was performed with the assistance of Dr. F. G. Finley and Dr. H. S. Shaw. The needle was inserted in the 5th intercostal space about $1\frac{3}{4}$ inches to the left of the sternum and withdrew 60 fluid ounces of creamy pus containing the diplococcus of Frankel in pure culture.

Great relief followed the aspiration but the fluid gradually accumulated again and in eight days had reached the former limits.

May 22nd—Pericardiotomy was performed under ether anæsthesia after a preliminary hypodermic injection of morphine, atrophine and digitaline. An inch incision was made in the 5th space two inches from the left border of the sternum and the pulsating pericardium exposed. On excising it 66 ounces of pus welled out, and the air kept rushing in and out with each cardiac beat. On the escape of the pus the pericardial opening was drawn up behind the 5th rib and some difficulty was experienced in introducing the No. 12 soft rubber catheter used as a drainage tube. It was not thought necessary to resect a rib. Immediate relief was experienced in the symptoms, the heart sounds became distinct and the pulse regular.

May 24th.—The pericardial fistula caused no distress but the space between the pericardium and the thoracic wall required washing out. From this time on the patient did well and by June 1st, the discharge had almost ceased, the wound was completely closed by June 3rd, and a subsequent attack of pneumonia (June 30th) on the right side had been recovered from perfectly. There was at the time the case was shown moderate hypertrophy of the heart but none of the physical signs peculiar to adherent pericardium.

Dr. McConnell in reviewing the literature of the subject then referred to other cases reported, his being the eighteenth, of which eight had died, and noted the following points of interest.

The cause, pneumococcus by extension from the lung.

The comparative absence of septic symptoms although the amount of purulent material was large, the quantity removed by incision being the largest hitherto recorded. The rapidity with which the

pus reaccumulated. The use of the phonendoscope in determining the position and size of the heart from the surrounding fluid. This was done by placing the rod attachment on the pericardial region and rubbing with the fingers gently over the skin and noting when the vibrations became intensified or disappeared.

He was not aware of this use of the phonendoscope having been heretofore noted, and considered it a valuable addition to the means of diagnosis in these cases and in distinguishing between dilatation of the heart, pleuritic and pericardial effusions. As a rule he found the phonendoscope less reliable than the stethoscope. In a recent case of double pneumonia tubular breathing could not be made out with the former although quite distinct with the latter. Crepitus and grating sounds were also sometimes produced by the instrument itself where emaciation existed and its large surface failed to remain in complete contact with the chest during the acts of respiration.

Dr. F. G. FINLEY corroborated Dr. McConnell's remarks with regard to the value of the phonendoscope in distinguishing the heart from the surrounding fluid dulness. The absence of septic symptoms might in part be due to the infection being by the pneumococcus, a much milder form than by the streptococcus.

Retiring President's Annual Address,

Dr. GEO. WILKINS said : On looking over the list that was handed me by the secretary, of the work done in the Society during my term of office, I was particularly struck with the large number of cases in which their most interesting scientific aspect was a purely physiological one. Although some of the more important cases displayed, to a remarkable degree, the skill and care of the surgeon engaged, in none of them was more than a simple elementary knowledge of anatomy required. Although anatomy is supposed to be the corner stone of surgery, Lister's scientific grasp of the significance of the profound philosophic teaching of Pasteur and its application to surgery in the preventing of access of germs, both at the time of surgical operations and their subsequent dressings, seems to have removed a very great proportion of anatomical restrictions, consequently in a society of physiologists, rather than one of anatomists, the relation of many of the cases named here would have elicited interesting discussions.

The unique sight of eight feet of intestines removed by Dr. Shepherd, with a large tumour, seen on our table, and the presence at the meetings some weeks later of the patient from whom they were removed, in a greatly improved condition, naturally causes the anatomical aspect of the cases to give place to the more important one of the physiological question as to the purposes served by the part

removed, and the minimum amount of intestine that will serve to carry on the digestive, absorbtive and secretive processes in a sufficient degree to maintain a long life.

In another case, operated upon by Dr. Armstrong, in which he had good grounds for hoping to have it recorded as one of the rare cases of recovery by surgical aid from perforating typhoid ulcer, the physiological as well as the pathological aspect of the case was prominently brought into view by a question aptly put by Dr. Adami. The patient referred to unfortunately died on the 40th day after the edges of the perforating ulcer had been united by Dr. Armstrong, as the result of perforation of an ulcer in another part of the bowel. The first ulcer had healed perfectly, but the continued progress of the fever, by its devitalising processes prevented the possibility of surgical success, when on the 40th day the ulcerating area referred to unfortunately gave way. During the discussion which took place on the report of this case, Dr. Adami very pertinently asked, Why not resect the ulcerating area at the first operation ? A good reason given by the operator was that it was too extensive. At that time I do not think Dr. Shepherd's patient just referred to had been on the operating table ; possibly had such been the case and the discussion assumed a physiological aspect, the possibilities are, had there been evidences then present, of any progressive ulcerated condition of the bowel, and of no very great extent, some further operative procedure might have been considered justifiable. Another view, a pathological one, and in my mind a very important one, is the possibility that by removing or excising the ulcerating portion, if deep seated and of limited extent, there is the probability that by the removing of the infective absorbtive area the further progress of the disease might be modified.

At another of our meetings a good theme for the physiologist, as to the extent important organs may be interfered with, was furnished by Dr. Bell on his exhibiting calculi removed by him, in one case from the substance of the kidney in which a large calculus was embedded, requiring operative procedure in the organ itself, and in the other removing an enlarged prostate in order to reach a large calculus in the bladder, both of which patients are alive and well to tell of the skill of the surgeon who removed them.

When one looks back at the times before Lister's influence was felt, and compares it with the surgery of to-day, as brought before the notice of this society by the cases just quoted, as well as many others, one cannot help being impressed by the removal of anatomical restrictions, and the importance of physiological restraints.

The question now is not, what struetures do you cut through, or

must you avoid, or do you push aside in order to reach a certain organ. Listerism practically gives the surgeon *carte blanche* to cut where he likes. The question is rather can you remove such and such organs consistent with their physiological functions, and the patient survive. What organs may be cut into, or partly removed consistent with life, or longevity. In what manner will the removal of these organs interfere with the functions of those that remain. These and several other questions of a similar nature point to the great importance of surgeons as well as physicians being posted at all times on the most recent physiological investigations which are continually being worked out in the modern teaching bodies. That this Society is not behind the times in which we live has been ably demonstrated by some interesting and important physiological work done by Prof. Mills in cerebral localization and related to the Society during the past session; and by Dr. Morrow on the effects of nicotine poisoning on the heart and lungs. To my mind, one of the most interesting and instructive papers read before this Society, is that by Dr. Webster on the biological basis of menstruation. His deductions drawn from the statement that every living cell possesses two forms of metabolism, one anabolic and the other katabolic, are most ingenious and afford much food for thought. In an address like the present I cannot do more than cursorily refer to it, and advise those who have not read it and thought over it, to do so at their earliest leisure hour. It displays much knowledge with careful reasoning and will amply repay its study. The paper is published in the April number of the MONTREAL MEDICAL JOURNAL.

Dr. Gardner's delightful study of the process of menstruation which he has so faithfully pictured to us during the last term, with modern views, reminds us again of the importance of studying the various ways in which nature may have her physiological functions disturbed Fortunately for our patients these functions may frequently be made to resume their normal condition without surgical interference, by the judicious use of remedies and methods of treatment ably advocated by Dr. Lockhart.

There are few medical societies, I believe, that can show as good evidences of the advances made in abdominal surgery as has been brought before us during the last year. That the hitherto terribly fatal malady of perforating gastric ulcer is well within the reach of the surgeon if promptly recognised, has been demonstrated to us by two patients exhibited by Dr. Bell and one by Dr. Kirkpatrick, who deserve the congratulations of the society upon their success.

The progress of medicine during the past year has been very ably

demonstrated in the bacteriological work of Prof. Adami, Drs. Wyatt Johnston, Martin, MacTaggart and Jamieson. I have already referred to the astonishing success in surgery as evidenced by the cases just mentioned, as well as others brought before this society, whose success is the indirect result of the teaching of bacteriology. Apart from explaining the causation of many diseases, its practical benefit has been well demonstrated by a case brought before this society in which Dr. Johnston was able to avert suspicions of a violent death, in the case of a Chinaman who died a few hours after being brought into hospital. By the examination of some nodules that were present and of cultures and also by inoculation he was able to prove that leprosy was the cause of death.

In connection with typhoid fever diagnosis, much good and most valuable work has been done. As we all know, the masked and insidious character of its onset very often renders its detection in an early stage almost problematical. There are few diseases therefore in which an unfailing pathognomonic sign is more useful. Dr. Wyatt Johnston's demonstration of the nature of the work done in this direction by Widal and others in the use of the so-called serum test has been of profound interest to this society. That it is possible for cases of typhoid fever to occur and the autopsy fail to furnish the apparently necessary condition of the bowel to confirm the diagnosis is well illustrated, as is also the value of the serum test, by a case reported two months ago as occurring in St. Mary's Hospital under the care of Dr. Cheadle in which there was no ulceration of the bowel and Peyers patches were perfectly normal. Yet the serum diagnosis during life and also post-mortem gave the required reaction, and typical typhoid bacilli were obtained from cultures of the spleen and various other organs. Dr. Johnston's method of using dried blood has very greatly simplified the procedure in the diagnosis test. His suggestion that it should be used in public health service is deserving of serious consideration. The amount of work done by him, and also in conjunction with Dr. MacTaggart is very extensive and we are delighted to see that it attracts so much favourable attention abroad. What they describe as "pseudo-reactions" caused by clumping of bacilli owing to the employment of very virulent cultures should be carefully noted and guarded against. When we call to mind the fact that Pasteur's best work was the unexpected result of a second injection of the contents of a flask containing a culture of the chicken cholera bacillns, when to his surprise he found the chickens proof to the virus, we feel that the philosophic genius at times displayed by Dr. Wyatt Johnston may, in the near future, reveal some more of the many hidden causes of some diseases.

One of the most interesting and startling productions of the physical sciences is the use of the so-called X-rays and their application to medicine. To have the metallic contents of a wooden box photographed through its cover is astounding, but its application to the practice of medicine so that the bony skeleton may be protrayed on the sensitive film of the photographer's plate is a revelation that is more than weird-like. The practical benefit of this method of demonstration was well shown in some skiagraphs of a patient of mine from whom Dr. Shepherd removed supernumerary digits, the skiagraph aiding him in deciding as to the plan of operation. Dr. Garrow also exhibited a case of a somewhat similar nature. That these rays may be injurious owing to long exposure has also been demonstrated by the formation of sloughs as was seen in a case of Dr. Armstrong's. Fortunately scientific methods have so far advanced that perfect pictures may now be obtained after only half a minute exposure—the shortening of the time being due principally to improvements in sensitiveness of the film. It is to be hoped that before another year is completed we will be able to record in this society the exhibition of skiagraphs of sclerosed vessels and of various forms of lung and heart affections as has been done elsewhere.

A very interesting case is one reported by Dr. Shaw who gives a very able clinical report of a case of "Pernicious type of anæmia incident to senile tuberculosis," in which Dr. Martin reported that tubercle bacilli was found in the fæces, whilst the intestine was perfectly normal. There can be little doubt that if the fæces were more frequently examined in phthisical cases similar conditions would be also more frequently met.

The importance of making microscopical examination in aid of diagnosis, where it is possible, is well shown in two cases of hæmatocele successfully operated on by Dr. Gardner. They were made the subject of a very interesting paper by him, the pathological examination having been made by Dr. Martin, who showed that malignant disease of the ovaries in the one case, and tubercular disease of the tubes in another, was the cause of the symptoms. If the same careful report and microscopical examination was made more frequently, when available. it is possible that tubal gestation would not so uniformly be considered the cause of that very alarming condition.

Another interesting fact demonstrated by the microscope is in connection with a case exhibited by Dr. Armstrong to the Society. The patient had suffered from one of the very frequent sequelæ of typhoid fever—suppurative osteo-myelitis, and on examining the pus numerous typhoid bacilli were found.

Amongst other instructive living cases brought before this Society by Dr. Armstrong, was one of a man who was suffering from the effects of depressed fracture of the skull. At the operation twelve inches of bone were removed completely, placed in carbolic solution, and six of them replaced and the wound united, and on exhibition at the Society eight weeks after, the parts were perfectly healthy and united, no necrosis of the bone having occurred.

Modern operative methods of treatment as brought to our notice, were well illustrated; not only by those I have already related, but also by three cases of cancer of the middle and upper portion of the rectum, which were removed by Dr. Bell by cutting through and pushing aside the sacrum and coccyx. The remarks made by him that early diagnosis of cases of this kind is quite exceptional, is one worthy of being kept in view when treating intestinal trouble, especially where the symptoms are directed to the lower bowel, and not to rest satisfied without a proper examination of the lower bowel.

When one compares the character and variety of the work and material brought before this society during the last few months, with that of only a few years ago, one cannot help being impressed with the fact that amongst our most useful members are some of its youngest.

It is a source of gratification to feel that we have amongst us so many of the younger ones who have both the time and the ability as well as the proper methods of application of both to demonstrate to the society that kind of work which is the foundation of our noble science. A very good example of that is furnished by the very able paper of Dr. Archibald in which he was able to show as the result of his own investigations as well as of those of Dr. Bradley, that one of the commonest forms of enlargement of the thyroid is due to a condition of localised adenomata of the gland tissue becoming the seat of repeated small as well as of single extensive hæmorrhages.

It is with the deepest regret that we have to record the death of one of our most enthusiastic and active members. Few men will be so greatly missed by all who knew him as my dear friend Dr. T. Johnson Alloway. His popularity was unbroken. His genial hospitality and unvarying kindness earned for him the love and respect of all who had the privilege of his society. His charm of manner, and amiability of disposition, and his enthusiasm for his profession were worthy of emulation. By his departure this society loses one of its most genial members, our profession one of its highest ornaments and the sick poor one of their most cheerful consolers.

I cannot close my address without congratulating the society on the distinguished honor we have had in having Lord Lister, the father of

modern surgery, one of the noblest benefactors of our race, partake of our hospitality. His graceful and emotional response to our congratulations on his elevation to the peerage is a sight that we will all remember. I must congratulate the society on the fact that the most successful meeting that the British Medical Association ever had was in our midst, and under the presidency of one of our members who possesses all the literary, social and professional qualifications that it is possible for an ideal officer of that kind to have, and who acted with ability, grace and the most lavish use of these various respective requirements, and I must again congratulate the society that my successor in office is one whom we all delight to honour."

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVII. DECEMBER, 1897. No. 6

Our readers will notice that the present number contains the index and list of contributors for the last six months of 1897. It has been decided to begin our next volume with January instead of June. The directors find that this will be more convenient for advertisers who prefer to make their contracts from January to January, and many subscribers prefer to make their selection of journals at the beginning of the year.

The management feel much encouraged by the steady increase in the number of subscribers. The aim of the editors is to publish a high class monthly journal that will keep its readers fully abreast with the advance made in the different departments of medicine and surgery. Montreal is becoming a great medical centre and has a very active Medical Society. Her hospitals afford exceptionally good opportunities for clinical study and research, and the JOURNAL will do its best to keep its readers posted concerning the work done in all departments.

An invitation is also extended to the profession throughout the country to make the JOURNAL a medium through which their ideas and observations can be given to others. Contributions of interesting cases and papers on medical subjects are always welcome, and reprints will be furnished when requested.

THE USE OF GARBAGE AND SEWAGE AS MANURE.

The division of chemistry of the U. S. Department of Agriculture is conducting an enquiry regarding the Agricultural Value of Street Sweepings, Garbage and Sewage. The object of the investigation is to find out the extent to which these materials are used as fertilisers, the results that have attended their use, and the best method of

applying them to the soil. They desire to obtain the opinions of the Medical Profession as to the extent of the danger of disseminating pathogenic organisms among men and animals by the use of sewage for the irrigation of field and garden crops. It is specially requested that any evidence of the spreading of diseases in this manner should be mentioned and if reports of them have been published that the Department be informed where such publications can be found.

At the Seventh Annual Meeting of the American Electro-Therapeutic Association, held in Harrisburg, Pa., the following were elected, viz.:

Officers.—Dr. Charles R. Dickson, President, 343 Sherbourne St., Toronto, Ont.; Dr. Frederic Schavoir, 1st Vice-Pres., 8 Atlantic St., Stamford, Conn.; Dr. Caleb Brown, 2nd Vice-Pres., Sac City, Iowa; Dr. Richard J. Nunn, Treasurer, 119½ York St., Savannah, Ga.; Dr. John Gerin, Secretary, 68 North St., Auburn, N.Y.

Executive Council.—Dr. Robert Newman, 64 W. 36th St., New York City; Dr. William J. Morton, 17 E. 28th St., New York City; Dr. William J. Herdman, 48 E. Huron St., Ann Arbor, Mich.; Dr. William T. Bishop, Harrisburg, Pa.; Dr. G. Betton Massey, 1636 Walnut St., Philadelphia, Pa.

The next (eighth) annual meeting will be held in Buffalo, N.Y., on Tuesday, Wednesday and Thursday, September 13, 14 and 15, 1898.

NEW BOOKS, ETC., RECEIVED AND NOTED.

Medical and Surgical Gynæcology, by R. W. Garrett, M.A., M.D. J. A. Carveth & Co., Toronto, Ont.

Vaginal Hysterectomy: a Review of Sixty-six Consecutive Cases, by Chas. G. Davis, M.D., Chicago. Reprint from Journal of American Medical Association, September 18th, 1897.

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He had an active mind and a warm, cheerful disposition, which gathered about him a very large circle of friends in all grades of society, who will feel that the country has lost a valuable citizen and who will long cherish his memory with the most kindly feelings.

modern surgery, one of the noblest benefactors of our race, partake of our hospitality. His graceful and emotional response to our congratulations on his elevation to the peerage is a sight that we will all remember. I must congratulate the society on the fact that the most successful meeting that the British Medical Association ever had was in our midst, and under the presidency of one of our members who possesses all the literary, social and professional qualifications that it is possible for an ideal officer of that kind to have, and who acted with ability, grace and the most lavish use of these various respective requirements, and I must again congratulate the society that my successor in office is one whom we all delight to honour."

THE

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VOL. XXVII. DECEMBER, 1897. No. 6

Our readers will notice that the present number contains the index and list of contributors for the last six months of 1897. It has been decided to begin our next volume with January instead of June. The directors find that this will be more convenient for advertisers who prefer to make their contracts from January to January, and many subscribers prefer to make their selection of journals at the beginning of the year.

The management feel much encouraged by the steady increase in the number of subscribers. The aim of the editors is to publish a high class monthly journal that will keep its readers fully abreast with the advance made in the different departments of medicine and surgery. Montreal is becoming a great medical centre and has a very active Medical Society. Her hospitals afford exceptionally good opportunities for clinical study and research, and the JOURNAL will do its best to keep its readers posted concerning the work done in all departments.

An invitation is also extended to the profession throughout the country to make the JOURNAL a medium through which their ideas and observations can be given to others. Contributions of interesting cases and papers on medical subjects are always welcome, and reprints will be furnished when requested.

THE USE OF GARBAGE AND SEWAGE AS MANURE.

The division of chemistry of the U. S. Department of Agriculture is conducting an enquiry regarding the Agricultural Value of Street Sweepings, Garbage and Sewage. The object of the investigation is to find out the extent to which these materials are used as fertilisers, the results that have attended their use, and the best method of

applying them to the soil. They desire to obtain the opinions of the Medical Profession as to the extent of the danger of disseminating pathogenic organisms among men and animals by the use of sewage for the irrigation of field and garden crops. It is specially requested that any evidence of the spreading of diseases in this manner should be mentioned and if reports of them have been published that the Department be informed where such publications can be found.

At the Seventh Annual Meeting of the American Electro-Therapeutic Association, held in Harrisburg, Pa., the following were elected, viz.:

Officers.—Dr. Charles R. Dickson, President, 343 Sherbourne St., Toronto, Ont.; Dr. Frederic Schavoir, 1st Vice-Pres., 8 Atlantic St., Stamford, Conn.; Dr. Caleb Brown, 2nd Vice-Pres., Sac City, Iowa; Dr. Richard J. Nunn, Treasurer, 119½ York St., Savannah, Ga.; Dr. John Gerin, Secretary, 68 North St., Auburn, N.Y.

Executive Council.—Dr. Robert Newman, 64 W. 36th St., New York City; Dr. William J. Morton, 17 E. 28th St., New York City; Dr. William J. Herdman, 48 E. Huron St., Ann Arbor, Mich.; Dr. William T. Bishop, Harrisburg, Pa.; Dr. G. Betton Massey, 1636 Walnut St., Philadelphia, Pa.

The next (eighth) annual meeting will be held in Buffalo, N.Y., on Tuesday, Wednesday and Thursday, September 13, 14 and 15, 1898.

NEW BOOKS, ETC., RECEIVED AND NOTED.

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